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The educational potential of reviews in instructional videos teaching declarative knowledge

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Table of contents

Table of contents	2
Acknowledgement.....	4
Abstract	5
1.The educational potential of reviews.....	6
2.Research context.....	8
2.1. Summaries in text and reviews in videos.....	8
2.2. Empirical research.....	12
2.3. Explanations for potential effectiveness of reviews.....	15
2.4. Research questions.....	17
3.Method	19
3.1. Research design	19
3.2. Participants.....	20
3.3. Instructional materials.....	21
3.4. Measurement instruments	24
3.5. Procedure	27
3.6. Data analysis	28
4.Results	30
4.1.Engagement.....	30
4.2 Self-efficacy and self-regulation.....	31
4.3. Learning outcomes.....	32
4.4. Interviews.....	32
5.Conclusion and significance of findings	35

Educational potential of reviews

5.1. Engagement.....	35
5.2 Self-efficacy and self-regulation.....	36
5.3. Learning.....	38
5.4. Students' learning experience.....	39
Limitations & future directions.....	41
References.....	42
Appendix A: Link to the videos and booklets.....	52
Appendix B: Learning goals of the video based on SLO goals.....	53
Appendix C: Text of the instructional video and reviews.....	55
Appendix D: Introduction page of booklet 1.....	60
Appendix E: Instructions about entering the video environment.....	61
Appendix F: Example of design of questionnaire.....	62
Appendix G: Concept map of the instructional video.....	63
Appendix H: Post-test questions codebook.....	64
Appendix I: Delayed-post test questions codebook.....	68
Appendix J: Self-Efficacy Questionnaire.....	72
Appendix K: Self-regulation questionnaire.....	73
Appendix L: Interview questions and Likert Scale.....	74
Appendix M: Instructions given about the experiment.....	75
Appendix N: Transcribed interviews.....	76

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Abstract

In this mixed-methods study, the insertion of reviews (i.e. *summaries*) in an instructional video teaching declarative knowledge is investigated. Among scholars, there is empirical consensus that summaries in texts are effective for the recall of information. Yet, in instructional videos, this is a topic of research. In this study, the experimental group and control group both watched an instructional video from the NPO about agriculture. The video for the experimental condition was edited by inserting reviews in between. For the control group, pauses were inserted which were lasting the same amount of seconds as the review (i.e. *segments*). 39 participants (mean age 8.49) started with self-efficacy and self-regulation questions. Thereafter, the students started watching the video with or without reviews while video logs recorded how much the video was played. Next, the students filled in the same self-efficacy questionnaire and students answered questions about the video (immediate post-knowledge test). Two weeks later a delayed knowledge test was administered, followed by the administration of eight interviews. The interviews gathered information about the students' general appreciation and instructiveness of the instructional video.

Results show that the engagement was high in both conditions. There was no significant effect found for self-efficacy or learning outcomes and no moderating effect of self-regulated learning. The results suggest that the provision of reviews, in comparison with the possibility to additionally process the information through inserted segments, does not lead to significantly higher learning outcomes. However, this study has contributed to a new line of research about reviews in videos teaching declarative knowledge. Design features for the development of reviews and the advanced theories in connection to reviews could be useful for educational researchers. More research is needed to clarify which instructional features in instructional videos (teaching declarative knowledge) could contribute to the desired learning outcomes.

Keywords: instructional video, reviews, engagement, recall, self-efficacy, self-regulation

1. The educational potential of reviews

The use of videos in education has increased massively in recent years (de Koning, Hoogerheide & Boucheix, 2018). Besides the use of instructional videos in informal settings, videos are one of the most frequently used media in classrooms. Instructional videos are considered to be powerful learning tools in comparison to static representation because they can present visual and auditory information at the same time (Hong, Pi & Yang, 2018). However, to be effective, videos have to be designed in an informed and responsible way and are ideally based on research-based design principles (Fiorella & Mayer 2018; Saltrick, Honey & Pasnik, 2004).

Nevertheless, the learning effectiveness of instructional videos is not yet consistently proven (Merkt, Weigand, Heier, & Schwan, 2011). Instructional videos may induce higher levels of cognitive load because students have to continuously integrate incoming information with previous information that also needs to be maintained in working memory (Ayres & Paas, 2007, Lusk et al., 2009). Therefore, it is important that the learner engages in adequate information processing while watching the instructional video (Schwan, 2013). When instructional videos are aligned with the working of the human mind, better learning outcomes are expected (Mayer & Mayer, 2015).

It is expected that summaries could facilitate learning from a video considering that the organisation of text is a well-known strategy to facilitate recall (Gabriel & Mayzer, 1963; Lorch, 1989). Mayer and Mayer (2015) emphasize that when a method (e.g. summary) is proven effective in one medium (e.g. text), it will be likely that it will be effective in another similar medium too (e.g. video). Accordingly, the theoretical framework also takes into account empirical research about the effectiveness of summaries in written texts. In the context of instructional videos, summaries are named reviews.

Alongside the cognitive processes, reviews in instructional videos could have motivational effects. Self-efficacy and self-regulation play an important role in learning (for example, from an instructional video) (Bandura, 1997). A student with a high self-efficacy belief for learning in a particular domain uses good analytic thinking, is committed and remains task-oriented (Bandura, 1994). Furthermore, self-regulation skills are needed to effectively process an instructional video (Merkt et al., 2011; Towler et al., 2008). Self-regulation ensures efficient learning because the learner is more aware of the learning process, for example through using cognitive strategies to effectively process the information (Thijs, Fisser & van der Hoeven, 2014; Towler et al., 2008).

Ultimately, instructional videos could be helpful for the learning process, however, students do not always engage in the right cognitive processing. Reviews in videos could assist the student to focus on the right information. In turn, the review may lead the student to think that the content is manageable to learn, resulting in a higher self-efficacy belief (Van der Meij & Van der Meij, 2016b). Accordingly, the goal of this research is to investigate the effects of reviews on motivation and recall among three and four graders in two primary schools in the Netherlands. The effects of reviews will be investigated in an experimental design. Logfiles are administered in order to gain insight into

engagement with the instructional video. In addition, the learning experience with the instructional video is considered from the students themselves using interviews. The insights of this research will contribute to the development of evidence-based design principles in an instructional video teaching declarative knowledge aimed at primary school students.

In short, this research is in different ways scientifically and practically relevant. Presently, researchers are just beginning to identify which instructional techniques improve learning from instructional videos (Fiorella & Mayer, 2018). When viewing is more purposeful deeper and sophisticated learning can occur (Kozma, 1991). Therefore, an important practical justification is that an increased understanding of the contribution of reviews in videos has to be developed. This could lead to improvements in instructional design principles for the development of instructional videos. To provide more in-depth insight, the effects on motivation will be taken into account.

An important theoretical justification is that research on instructional videos teaching declarative knowledge with the insertion of reviews is scarce. The only study found is from 12 years ago and is performed by Michel and Roebers (2008). A significant effect on learning outcomes was found when reviews were inserted in an educational film. Furthermore, limited research on instructional videos is performed with elementary school students as the target group. In addition, the participating students will be interviewed and asked about their experience with the instructional video since reviews are not commonly presented in instructional videos (Brar & Van der Meij, 2017).

In order to investigate the effects of reviews on motivation and learning outcomes, relevant empirical research will be examined in the following section. What follows is an outline of the method of this study, subsequently, the results are described. Thereafter, in the discussion and conclusion, the results will be compared to empirical research and possible explanations are suggested. The thesis will end with a presentation of the references and appendices.

2. Research context

This chapter will comprise of existing theory relevant for this study. In the first section, relevant concepts for this research are explained. Before explanations are given about reviews, research about the positioning and goals of summaries in written texts is considered in order to derive guidelines for the development of the review. The second section will consist of empirical research about reviews in instructional videos and summaries in written texts. Then, the reasons behind the hypothesized potential effectiveness of reviews are explored. The chapter ends with the experimental design and research questions.

2.1. Summaries in text and reviews in videos

Instructional videos teaching declarative knowledge. Instructional videos are video lessons that assist people in learning the targeted material (Fiorella & Mayer, 2018). Video instructions lead to improved recall of content due to the attractiveness of the video format and the increased attention of students to video instruction (Mayer and Mayer, 2015; Hong et al., 2018). Videos as an instructional medium can teach procedural or declarative knowledge. The present study focuses on an instructional video teaching declarative knowledge. Consequently, the instructional video is supporting declarative knowledge development, especially semantic memory. Facts, concepts and meanings are stored in semantic memory which is responsible for making associations between arbitrarily related information (Kidd & Kirjavainen, 2010). To support information processing and thereby declarative knowledge development, reviews could serve to assist the student to focus on the right information.

Research about written texts. Since there is limited empirical research available on reviews in an instructional video teaching declarative knowledge, it is relevant to take research about summaries in written texts into account. Mayer and Mayer (2015) state when a certain medium has been proven effective and it is similar to another medium, it is likely that the method will be effective in the other medium too. According to Clark (2005), it is not the medium that makes the difference, rather it is the way the instructor and the designer make use of the features that are available. Van der Meij, Van der Meij, Voerman and Duipmans (2018) add that effective instructional videos should make use of the learning opportunities of video and at the same time try to incorporate key qualities of written texts. For that reason, the proven effects of summaries in texts must now be tested on instructional videos teaching declarative knowledge.

Summaries in written texts. A text summary conveys a recap of the text to the reader. One of the most prevalent reasons to use summaries is their already proven effectiveness for the recall of content (Hartley, Goldie & Steen, 1976; Hartley & Trueman, 1982; McLaughlin Cook, 1981). Summaries can have different roles and positions, which are discussed in the section below.

The positioning of the summary. Summaries can be positioned before and after the text they represent (Hartley et al., 1976 & Lorch, 1989). Thus, the position of the summary should be based on the role of the summary. A beginning summary is positioned before the text and can help clarify its

content in order to help the student decide whether it is useful to read the text or not (Hartley et al., 1979). Another function of the beginning summary is facilitating the students' organization of thoughts about the text.

The end summary is placed at the end of the text and its function is reviewing the previous content by listing the main points of a text (Hartley & Trueman, 1982). Woolfolk (2014) recommends using summaries in the middle or end of the lesson which is relatable to the QuickScan-approach. According to the QuickScan-guidelines, multiple short beginning summaries appear several times throughout the text (Van der Meij, Van der Meij & Farkas, 2010; Zhou, 2008). So, in the context of reviews, multiple reviews appear throughout the video. In this study, the QuickScan-approach (i.e. guidelines for using summaries in text) is adapted for the use of reviews in instructional videos.

Reviews in instructional videos. Reviews in videos (i.e. *summaries*) could be useful to support retention processes (Van der Meij, 2017). A review of an instructional video is comparable to a summary in a written text (Van der Meij & Dunkel, 2020), thus a review summarizes the main points in a video (Brar & Van der Meij, 2017; Van der Meij & Van der Meij, 2016a; Van der Meij & Van der Meij, 2016b; Van der Meij et al., 2018). It is hypothesized that a review can enhance retention and increase the students' self-efficacy (Van der Meij, 2017; Van der Meij et al., 2018).

Prerequisites review. However, a review has to meet some specifications before it could have positive effects. First, a review can be only beneficial when there is a fit between the content and the structure of what the student sees and what must be remembered (Van der Meij & Van der Meij, 2016a). A review should be designed in such a way that it assists the student in remembering the content. This is accomplished by showing a condensed format of the presented video (Van der Meij & Dunkel, 2020).

Second, reviews could be less effective when there is a preview included. In the study of Van der Meij et al. (2018) previews were included before the actual video and review. It is advised to not use previews because they could give the students the false impression that the preview already gives a comprehensive overview, which is the aim of the review.

Design guidelines review. To be scientifically grounded, a review has to be developed according to a couple of guidelines. These guidelines are inspired by the QuickScan approach where multiple summaries in the text are used in order to enhance the recall of declarative knowledge of a text (Van der Meij et al., 2013). Studies have shown that when readers read the QuickScan-version of a text, it leads to significantly higher recall scores (Van der Meij et al., 2013; Van der Meij & Van der Meij, 2012; Zhou, 2008). The QuickScan approach is chosen as a leading guideline because of the similarities with the designed review in this study, namely: the focus on declarative knowledge and the presence of multiple reviews. Moreover, no other guidelines were available due to the exploratory nature of this research.

QuickScan takes into account the organisational and signalling function of summaries through offering information about the text structure (i.e. organisation) and through the use of numbered list

Educational potential of reviews

items (i.e. signalling) (Van der Meij et al., 2013). One guideline from the QuickScan approach will not be taken into account, namely placing the summary before the summarized text. As mentioned before, presenting a preview in a video is proven to be ineffective. The design guidelines from QuickScan are shown in Table 1. In addition, content guidelines for making an effective summary are used, which are summarized in Table 2.

Besides design guidelines and content guidelines, several multimedia guidelines for the design of the review video are used, an overview is provided in Table 3. The review video is made according to the coherence principle because extraneous material will be eliminated in the review video.

Thereby, the reviews ensure that the video is segmented by adding smaller segments within the video.

Figure 1 shows an example of one of the developed reviews for this study.

Figure 1

Example of a developed review for this study.

- Wanneer de koe voelt dat haar uier vol zit, loopt zij zelf naar de melkrobot
- De halsband van de koe stuurt een signaal naar de melkrobot
- Hierdoor weet de melkrobot precies hoe de koe gemolken moet worden

- Melkwagens halen de melk uit een koeltank en brengen de melk naar de fabriek

- In de herfst staan alle koeien op stal, behalve de koeien die nog een kalfje krijgen

Table 1

Design Guidelines from QuickScan (Zhou, 2008)

Guidelines text	Translation to video
Summaries appear throughout the text	Reviews appear throughout the video
A summary is presented in a grey field	After the original part of the video, a review video is added which will have a grey background colour in order to make the distinction between the original video and the review video.
One sentence in the QS-box summarizes one paragraph in the text	One to three sentences in the review summarizes one paragraph of the text of the video. Every sentence has a bullet point. A blank line indicates the start of a new topic or paragraph.
One box includes approximately four sentences	After approximately four paragraphs of text, a review is included in the video.
In front of every sentence, a number is stated with a special brace to let it stand out.	When it would be technically possible, the guidelines could be followed by incorporating a possibility for the student to click on relating numbers in the play bar if he or she wants to replay the corresponding part of the video.
The number can be found in the text so that the reader can quickly see which sentence summarizes which part of the text.	

Table 2

Content Guidelines for making a summary (based on Weiss, 2012)

	Guidelines from text translated to video
<i>Structure</i>	<p>Step 1) Divide the text from the video into separate paragraphs. Often, the vision of the author can be taken as a good basis.</p> <p>Step 2) Find a label for every paragraph, which describes the function of it. The labels must signal the major structure</p>
<i>Content</i>	<p>Step 3) Classify every sentence as major or minor information</p> <p>Step 4) Thereby, consider that major points must include a new, important piece of information; a new concept. To create a concept statement, only use major information. Make sure that you use the concept. Rewrite the concept statement in your own words.</p> <p>Step 5*) Divide the minor statements into categories like detail, example, definition, story, repetition, etc. Minor points are subordinate, less important and often additional information, where no new concepts are given.</p> <p>* This step is not used as a guideline because the current study based the review on major statements since this has been proven effective in text (Weiss, 2012).</p>

Table 3

Multimedia design guidelines review video

Guideline	Description	Reference
Coherence principle	Extraneous material is eliminated (seductive details are eliminated in the review video)	Rey (2012)
Segmenting principle	Break presentation in parts (by adding the review, the video is naturally segmented)	Mayer and Chandler (2001); Hasler, Kersten and Sweller (2007)

2.2. Empirical research

Reviews in instructional videos. In this section previous research about reviews in instructional videos is discussed. It should be noted that most of the discussed research focuses only on procedural knowledge and not on declarative knowledge which is the topic of this research.

Van der Meij and Dunkel (2020) conducted an experimental study with a factorial design. The conditions in the study were: control (only instructional videos), practice (instructional video + practice), review (instructional video + review) and review and practice (instructional video + review

Educational potential of reviews

+ practice). The target group was university students and they watched tutorial videos about statistics. The unique play rate of the reviews was 66% and the engagement time was about 95%, so participants spent more time processing the instructional video than the review video. No effect of condition was found on task relevance, transfer test or the knowledge test. A positive contribution of the review to self-efficacy was found.

Van der Meij et al. (2018) included a review condition (preview-demonstration-review), no-review control condition (preview-demonstration) and a second demonstration condition (preview-demonstration-second demonstration) in their experiment. The participants from upper grades of elementary school had control over video play and time for practice. The authors reported that there was no effect of the review on task performance, which could have been due to the presence of previews. Self-efficacy increased most for the review, but an effect of condition was not found.

Brar and Van der Meij (2017) assessed the contribution of reviews to learning outcomes in an experimental setting. A video tutorial about conducting a T-test was shown followed by a review in the experimental condition, but no review was shown in the control condition. Participants were university students and did better on the knowledge and -performance test when they were in the review condition, but this difference was not statistically significant. Another finding was that the engagement data was lower in the review condition (90% vs. 98%). Motivational variables were not taken into account in this study.

Van der Meij (2017) conducted an experiment with a control group who watched only demonstration videos and an experimental group where a review was included after the video. The target group was elementary and -secondary school students and the videos taught Word formatting tasks. The task performance of participants in the experimental group increased after watching the review video. In addition, the first review received a high engagement score but thereafter the engagement was relatively low (32%). For self-efficacy, no significant effect of the review video was found.

Van der Meij and Van der Meij (2016 a,b) performed an experiment with an experimental condition (with reviews) and a control condition (no reviews). The audience were upper elementary- and/or lower secondary school students and video tutorials about formatting tasks in Word were shown. Both studies found that learning outcomes were higher in the review condition. Van der Meij and Van der Meij (2016a) reported that reviews enhanced self-efficacy. In their experiment, participants had unlimited access to the video during the training which is in contrast with the study from Van der Meij and Van der Meij (2016b). The results show that the review led to higher appraisals for task relevance. The effect of condition on self-efficacy was not found which could be due to the lack of user control (Van der Meij & Van der Meij, 2016b).

Michel and Roebers (2008) completed a study about reviews in an educational film teaching declarative knowledge using a factorial design including 4 conditions (original film, preview before the film, inserted reviews during the film, audio preview before the film). The stimulus material was a

Educational potential of reviews

film part of an educational television series about sugar beets (also one of the topics in the instructional video used in the current study). The main finding was that learning outcomes were significantly improved when students watched the educational film with inserted reviews compared to the original film.

Overall, the studies found mixed effects on procedural knowledge development. Declarative knowledge development is examined in two studies. Van der Meij and Dunkel (2020) found no significant effect and Michel and Roebbers (2008) found a significant effect on learning outcomes. Besides, the review videos are viewed less extensively than the original instructional videos. For motivational variables, mixed-effects are found. Three studies found a significant effect on self-efficacy, one on task relevance and two studies found no effects on motivational variables.

Summaries in written texts. This section describes previous research about the effectiveness of summaries in written texts.

The influence of the summary position on text recall was researched by Hartley, Goldie and Steen (1979). Three conditions were investigated in an experimental design: a) beginning summary, b) end summary, c) no summary. After participants read the text, questions were asked about the text. Participants recalled the most when they were in the 'end summary-condition'. No differences were found between the scores of students who read the beginning summary or the students who did not read a summary at all.

McLaughlin Cook (1981) argued that the absence of a positive effect in the previously described experiment might be due to inattention towards the beginning summary. Therefore, the researcher set up an experiment consisting out of four conditions: a) beginning summary on the same page as the text, b) beginning summary on a separate page from the text, c) end summary and d) no summary. Participants answered a number of questions and thereafter recall was measured. Higher recall scores were found when participants were in the conditions with the beginning summary on a separate page from the text and those with an end summary. There was no difference found between the conditions.

Hartley and Trueman (1982) conducted a review study about summaries. In their paper, the authors describe one study from 1955 (i.e. Christensen & Stordahl) that found no evidence for the effects of summaries and one study from 1973 (i.e. Vezin, Berge & Mavrelis) that reported a significant effect when an end summary is included. Vezin et al. (1973) used almost the same target group as the current study, namely nine-year-olds. Besides, Hartley and Trueman (1982) examined five other empirical studies about the effect of the placement of summaries on text retention and recall.

The examined studies by Hartley and Trueman (1982) used texts that included a) a beginning summary, b) end summary or c) no summary. Participants had to read a text once (if applicable, the summary) in order to make a judgment about its readability. Subsequently, the participants answered recall questions. The main conclusion was that recall scores were 7% higher when a summary was included. However, no negative influence was found on recall for information that was not included in

the summary. In addition, there was no significant difference found for the summary position, so beginning and end summaries were found to be equally supportive.

Along with the described research about the effectiveness of predefined summaries, there is research available about the effects of predefined versus self-generated summaries. Most studies indicated that predefined summaries are more effective for learning than self-generated summaries (Leopold et al., 2013). The explanation for this finding could be that students sometimes focus on irrelevant information when self-generating summaries, whereas the goal of a summary is providing an overview of the main points of a text (Hartley et al., 1979; Hartley & Trueman, 1982; Lorch, 1989). Based on the argument of Leopold et al. (2013), predefined summaries are used in the instructional video.

2.3. Explanations for the potential effectiveness of reviews

First, expected motivational effects are described since variables as engagement, self-efficacy and self-regulated learning are helpful in the learning process. Then, it is discussed how reviews could facilitate learning.

2.3.1. Motivational effects of reviews in instructional videos

Engagement. As stated in the introduction there is place for improvement in the design of instructional videos, since participants still do not fully engage with these videos (Guo, Kim & Rubin, 2014). Engagement is a prerequisite for adequately processing the instructional video. Therefore, engagement serves as a control variable in this study.

Cognitive engagement. Cognitive engagement while watching the video facilitates the recall of information (Kozma, 1991; Mayer, 1980; Zimmerman & Martinez-Pons; 1990). When students are cognitively engaged with the learning material they use cognitive strategies such as rehearsing, organizing and elaborating the information using existing knowledge (Greene, Dillon & Crynes, 2003). Students can learn more deeply and sophisticated when the viewing is purposeful instead of watching a video casual and effortless (Kozma, 1991).

Motivational engagement. A student with a conscious and a priori willingness to watch the video is motivationally engaged (Hoffman & Nadelson, 2010). The strength of engagement is determined between the interest and task challenge. In the study from Moshabab (2017) appeared that dental students' perceived usefulness of a video influences their viewing behaviour positively (Moshabab, 2017). So, what the student thinks about a video affects their ability to learn from it. Thus, engagement is a crucial variable in predicting the effect of an instructional video. Students' attitudes concerning the usefulness and ease of use can play an important role in their willingness to engage in the video (Davis, 1989; Pan, Sivo, Gunter & Cornell, 2005; Taherdoost, 2018).

Motivation. A commonly used definition of motivation is that a student is driven to do something (Ryan & Deci, 2000). Reviews are hypothesized to have an (moderating) effect on two

concepts regarding motivation which are discussed in the section below. Motivation is taken into account because learning outcomes are influenced by the motivation of students (Bembenny & Karabenick, 2004).

Self-efficacy. The provision of support, in the form of the review, is hypothesized to be a cognitive tool that will facilitate self-efficacy. Self-efficacy is the extent to which the student believes she has enough knowledge and skills to perform a task in a particular situation (Bandura, 1997). A higher self-efficacy belief is beneficial because this belief can positively affect the students' persistence while watching the video and her motivation to achieve in a learning task (Bandura, 1997; Zimmerman, 2000).

Self-efficacy can be stimulated through 1) giving success experiences, 2) observing that someone else has success, 3) support from the teacher, 4) the students' own response (for example, when the student feels happy about her presentation this facilitates the self-efficacy the next time) (Bandura 1994; Woolfolk, 2014). It is expected that a review supports students in defining what they have to know about the video. So, when a review recapitulates the key points it conveys the impression that the content is manageable to learn, increasing the students' self-efficacy belief (Van der Meij & Van der Meij, 2016b). Van der Meij and Dunkel (2020) and Van der Meij and Van der Meij (2016b) found a higher self-efficacy belief in the review condition in comparison with the control condition.

Self-regulation. Second, regarding self-regulation: the review can be helpful for students with low summarization skills (Brar & Van der Meij, 2017). Summarization skills are part of cognitive learning strategies in the self-regulated learning theory (de Boer et al., 2013). If a student will use cognitive learning strategies while watching the video, depends on her level of self-regulated learning skills. A self-regulated student adjusts her actions, ideas and feelings to achieve the imagined goal and thereby directs her own learning process (Boekaerts & Simons, 1995). Metacognition forms the basis for processes involved in self-regulated learning and is defined as having knowledge about your own knowledge (De Boer et al., 2013). A student has metacognitive knowledge when she knows why and when to use learning strategies.

Thus, whether the student can be labelled as a self-regulated learner depends on her use of the following strategies: 1) cognitive strategies, 2) metacognitive strategies, 3) management strategies and 4) motivational strategies (de Boer et al., 2013). This study focuses on cognitive strategies because these are focused on learning strategies aimed at information processing, remembering and integration of new information in existing knowledge (Kostons, Donker & Opdenakker, 2014; Vandenbussche, 2010). Facilitating information processing is also the aim of a review.

When the student applies the above-mentioned strategies, she has the self-regulation skills required for independently watching and processing instructional videos (Merkt et al., 2011; Sun, Wu & Lee, 2017). Without self-regulation skills, it is likely that students will drop out or procrastinate when guidance is missing. When there is a lack of guidance, students have to rely on self-monitoring

and work independently on the learning content (Sun et al., 2017). The goal of this study is to investigate if a review could facilitate self-regulated informing processing while watching a video. Ideally, the review serves as a frame of reference which can be used as a students' self-constructed review of the content (Van der Meij et al., 2018). When the student notices a discrepancy this can result in replaying a section from the video which would fit the self-reflection phase in self-regulated learning (Zimmerman, 2002).

2.3.2. Reviews could facilitate learning

One of the most prevalent reasons to use reviews in videos is their already proven effectiveness for the recall of content in texts (Hartley, Goldie & Steen, 1976; Hartley & Trueman, 1982; McLaughlin Cook, 1981). Some of the goals of reviews have been discussed but it is not clear yet how they could aid memory. However, scholars advanced some hypotheses about the reasons why reviews could facilitate learning.

Use of organisation and signalling in reviews. First, providing an organization of the information could help the student in recalling the information because the topic structure provides a plan for retrieval of the information (Lorch, 1989). A coherent representation of the information will facilitate memorization. As a consequence, the information is more accessible in memory at the moment of recall.

Second, reviews could have a signalling function by assisting the reader to attend to the main points in order to remember them (Lorch, 1989). So, the signalled information in reviews could facilitate the organisation of the information which is in line with the signalling principle from Mayer & Mayer (2015). Various studies report about the merits of signal use in texts. For example, the use of numbers in texts leads to better recall of the cued information (Goldman, 1988 in Lorch, 1989).

2.4. Research questions

The present study continues the line of research on reviews in instructional videos. Videos are frequently more used in primary education and could be helpful for the learning process. Therefore it is important that videos are optimized in terms of learning effectiveness. In the context of texts, summaries have already proven their effectiveness which now has to be tested within the context of instructional videos. Reviews in videos could assist the student to focus on the right information. The target group is primary school students since limited research about reviews is performed with this target group, except for the study from Michel and Roebbers (2008).

The main research question is: *'What is the effect of reviews in an instructional video teaching declarative knowledge on primary school students' (i.e. grade 3-4) motivation (i.e. engagement, self-efficacy, self-regulated learning) and learning outcomes?'*

Educational potential of reviews

The following sub-questions are asked:

1) To what extent does a review influence students' motivation?

a) To what extent does a review influence students' video engagement?

Based on previous research with reviews in videos (Van der Meij & Dunkel 2020; Van der Meij et al. 2018; Brar & Van der Meij, 2017), it is predicted that student's video interaction with the review video will be lower than with the instructional video.

b) To what extent does a review influence students' self-efficacy?

Regarding self-efficacy, the tested prediction is that the control group will have higher outcomes on self-efficacy through the presence of reviews. The review increased self-efficacy in previous studies (Van der Meij & Dunkel, 2020; Van der Meij et al., 2018; Van der Meij & Van der Meij; 2016a). However, this effect was not found in the studies from Van der Meij (2017) and Van der Meij and Van der Meij (2016b).

c) To what extent is there a moderating effect of self-regulated learning?

Self-regulated learning skills will be taken into account because students have to rely on self-regulated learning skills while watching an instructional video (Sun et al., 2017). It is hypothesized that a review could compensate for self-regulated learning skills, so it is expected that a high amount of self-regulated learning skills will have a positive effect on the knowledge tests of the control group because there is no guidance of the review. For the experimental group, it is expected that the review could compensate for not using self-regulated learning strategies. However, when participants in the experimental condition already have a high amount of self-regulation skills, there is probably no effect of self-regulation in the experimental condition because the student does not need the guidance of the review anymore.

2) To what extent does a review contribute to learning?

a) To what extent does a review influence students' immediate learning outcomes?

b) To what extent does a review influence students' delayed learning outcomes?

It is expected that students in the experimental group will have higher retention outcomes than the control group. Based on the arguments of Clark (2005) and Mayer and Mayer (2015) it is expected that reviews will be effective since they already have been proven effective for the recall of information in texts.

3) How do students experience the instructional video (with and without review) in terms of general value and cognitive value?

Since there is no previous qualitative research carried out on this topic there are no real expectations.

3. Method

This section is concerned with the description of the execution of this research. First, the research design is described, followed by the characterization of the participants. Then, the instructional materials used in the study are explained and measurement instruments are illustrated. What follows is an explanation of the procedure. The chapter will end with a description of the data analysis.

3.1. Research design

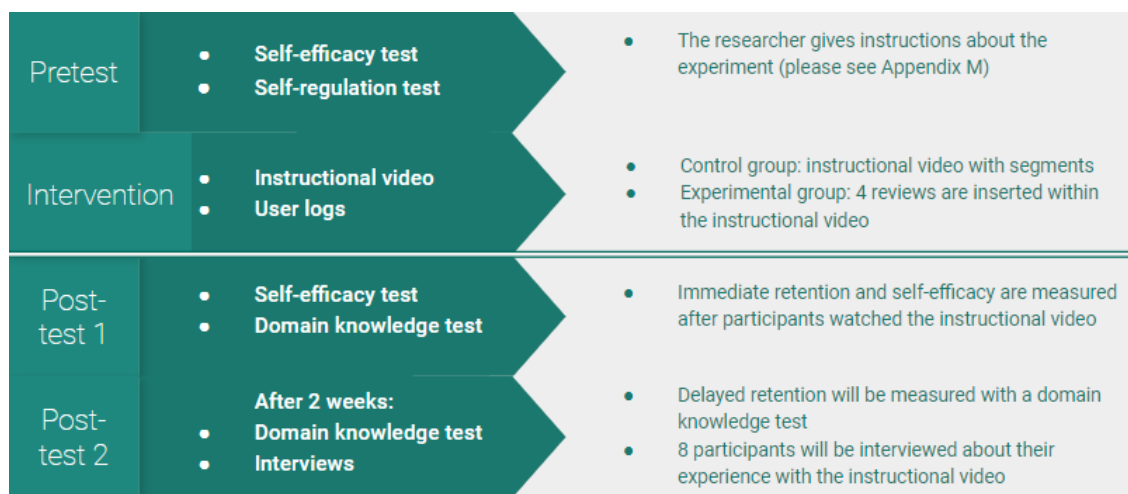
In order to examine the effects of reviews on student outcomes, a quantitative experimental research design with a randomized controlled trial will be used in this study. Previous studies on reviews also used an experimental design which makes it easier to compare results (Van Loon, Van der Meulen & Minnaert, 2015). Thereby, an experiment is suitable to examine the effects of one variable on the other. Engagement, motivation and recall are the dependent variables and the presence of a review is the independent variable.

The participating students are randomly assigned to the experimental or -control condition while they watch the same instructional video. The video for the experimental condition was edited by inserting four reviews in between. For the control condition, pauses were inserted which were lasting the same amount of seconds as the review, since segmenting stimulates retention processes (Spanjers, Van Gog & Merriënboer, 2010).

After the experiment, interviews will be held in order to examine students' opinions of the general and cognitive value of the instructional video. The interviews will be semi-structured since that will help in making a comparison in responses between participants of the experimental and -control group (McIntosh & Morse, 2015).

Figure 2

Overview of the research design



3.2. Participants

Based on convenience sampling, two classes of grades three and four of two different primary schools are selected which resulted in a total number of 41 participants. At first instance, two primary schools were selected in this research. However, due to technical problems during data collection at one school, there was another school selected to meet statistical prerequisites. One participant from the control group was removed because he does not want to participate and another participant from the control group was removed from the dataset because all the engagement scores were outliers (<3 SD from the mean scores). In the end, the control condition contained 18 participants and the experimental condition contained 21 participants. Table 4 shows an overview of participants' characteristics over the different conditions.

To assure that differences in students' outcomes cannot be ascribed by factors of the school, students are randomly assigned to condition, after stratification for the classroom. When examining group differences, a prerequisite for relatively high power is that there are approximately 20 participants per condition (Wilson Van Hoorhis & Morgan, 2007). The mean age of the participants was 8.49 years with a standard deviation of 0.68. Between the conditions there were no significant differences regarding age $X^2(2) = 1.83$, $p = 0.692$, gender $X^2(2) = 0.01$, $p = 0.92$, group $X^2(2) = 0.56$, $p = 0.45$ and initial self-efficacy $X^2(2) = 14.52$, $p = 0.752$.

As indicated in figure 2, for the qualitative part, a selected group of participants engaged in structured interviews about their experience with the instructional video with and without reviews. The Ethical Committee of the University of Twente gave approval for the study. Before participants were included in this research, the teachers gave permission to execute this research.

Table 4

Participants characteristics (N= 39)

	Experimental condition	Control condition	Total
Sex			
Male	9	8	17
Female	12	10	22
Age (years)			
7	1	0	1
8	12	9	21
9	6	8	14
10	2	1	3
Grade			
3 (groep 5)	13	8	22
4 (groep 6)	8	9	17

3.3. Instructional materials

Two types of instructional materials were used in this study, namely the instructional video and booklets. The instructional video ‘Akkers en Weilanden’ from the Dutch educational television series ‘Rondje Nederland’ of the NPO was used in this study (NPO, 2013). The decision was based on the suitability for incorporating reviews in the video by using the guidelines explained in Table 1 and Table 2. For the students in the experimental condition, the video was edited by inserting reviews in between. See Appendix A for the links to the edited videos for the experimental and -control condition.

In addition to the instructional video, booklets were used that provided procedural instructions, questionnaires and knowledge tests. The links to the used booklets can also be found in Appendix A. The procedure for the experiment was pilot tested for usability with one 8-year-old boy and one 9-year-old girl. Based on pilot-testing, adaptations were made concerning the design of the booklet, clarity of explanations and word choice.

Instructional video. The primary school curriculum of ‘Orientation on yourself and the world’ for the third and fourth group which is part of ‘zaakvakken ’ (i.e.: geography, history), forms the foundation for the instructional video (SLO, 2019). The goal of ‘Orientation on yourself and the world’ is that students broaden their view on the world within the domains of people and society, space, nature and technology and time. The domain people and society is not part of the chosen instructional video. Third graders have been taught geography from September and fourth graders have had geography for at least a year.

Learning content. The instructional video treats different topics which are elaborated on in this paragraph. An overview of the topics can be seen in Table 5. The video starts with explaining different domains of agriculture, namely arable farming, stock breeding and mixed farms. Further, students learn that organisms can have certain relationships in food chains and they learn about the use of fields in agriculture. In addition, the working of the milking robot is explained in the video. Besides, the instructional video attends to the differences between practicing a profession in agriculture between now and then. Based on the goals of the SLO, corresponding learning goals for this video are abstracted in order to develop a valid knowledge test involving a proportionate treatment of all objectives. The abstracted SLO learning goals and explanations for the relation with the content from the video can be found in Appendix B.

Table 5*Segments and corresponding topics of the instructional video*

Video segment	Segment duration (in seconds)	Topic
1	0:00 - 1:30	Relationship in food chains Domains of agriculture
2	1:30 – 2:05	Use of fields / population concentration
3	2:05 – 2:42	Domains of agriculture
4	2:42 – 4:21	Relationship in food chains
5	4:21 – 7:34	Domain of agriculture
6	7:34 – 10:03	Working of milking machine
7	10:03 – 11:12	Use of fields
8	11:12 – 14:39	Former times

A design feature of the video: seductive details. Seductive details are information which is not relevant to achieve the instructional objective of the video. However, the information is interesting for the student because it may be personally relevant which may lead to increased students' attention (Garner, Gillingham & White, 1989; Towler et al., 2008; Rey, 2012). An example of a seductive detail in the instructional video 'Akkers en Weilanden' is the moment when Sanny (the presenter) and the boy from the farm, are bringing cows to the milking machine. It is interesting and funny to see but the fragment is not relevant to teach the targeted learning content.

Scholars propose different effects of seductive details, opponents believe that seductive details are harmful, thus impairing learning outcomes (Garner, Gillingham & White, 1989; Harp & Mayer, 1998, Rey, 2012). Wang and Adesope (2016) report corresponding results but their results suggest that retention is more vulnerable than transfer to seductive details, contradicting the findings from Rey (2012). On the other hand, proponents believe that seductive details could lead to improvements in learning outcomes. Fries, DeCaro and Ramirez (2018) conclude that students with lower prior knowledge learned more when seductive details were included in a high stakes learning environment. They argue that seductive details naturally segment the video, giving students a break to process the information. In addition to reported cognitive benefits, Maloy, Fires, Laski and Ramire (2019) and Fries et al., (2018) report motivational benefits of seductive details. For example, seductive details could help relate the content to everyday knowledge.

Characteristics of videos and presentation. The original video had a duration of 14 minutes and 39 seconds. However, by adding the reviews, the duration of the video for the experimental group (i.e. review video) is 16 minutes and 1 second. The first review appeared after 4.48 minutes and lasted for 28 seconds. Subsequently, at 8.38 minutes, the second review of 14 seconds was presented, at 11.18 minutes a third review followed, lasting 26 seconds. Lastly, at 15.33 minutes the fourth review of 28 seconds was presented. The text of the video and the texts for the review can be found in appendix C.

The video for the control group lasted also 16 minutes and 1 second because segments were inserted in the video instead of the reviews. The segments had the same format and lasted the same amount of time as the reviews. However, in every segment, a heuristic was incorporated, namely: ‘Try to remember what was told in the previous piece of the video’. In this way, the students in the control group do not have the assistance of the review in remembering the content but they are stimulated to engage in active processing.

Students had access to the video via the website ‘Graasp’ and there were two different websites made for each condition. The instructions and design of each website were the same. Above the video, a short text was presented that instructed the students that they were able to replay, pause, rewind and fast-forward the video.

Booklets. In order to guide the students’ behaviour before, during and after the experiment, paper booklets were designed. The booklets presented the test items in chronological order of the experiment and students wrote down their responses and answers in the booklet. Every student receives the same booklets, which were three in total. Booklets one and two were designed for the first meeting and booklet three for the second meeting.

On the first page of the booklet, students have to fill in their sex, age and grade in order to gain insight into background characteristics and to be able to see to which extent results could be compared to each other. In line with Krooshoops’ (2019) approach, the booklets started with an introduction page, on which icons that were used in the booklet were explained (see Appendix D for the introduction page). In addition, it was instructed what was expected of the students (e.g.: “Read the question carefully before you write down the answer. You have 15 minutes to answer the questions. It’s okay if you don’t know the answer. Good luck!”) Lastly, instructions on what to do after the tasks were provided, namely students had to read in their own reading book.

The first booklet contained a test and questionnaires followed by guidance about entering the online environment, accompanied by screenshots of the online environment. Students were guided towards the correct elements through signalling. Appendix E shows the instructions that were given in the booklet. The second booklet consisted of questionnaires and tests that had to be answered after watching the video. The self-efficacy questionnaire started with a practice item to ensure that students know how to fill in the questionnaires (as an example, see Appendix F). On the first page of this

booklet was indicated that students were not allowed to watch the video again. Booklet three was designed for the second meeting and contained the delayed knowledge test.

3.4. Measurement instruments

Engagement. Video engagement was assessed on the basis of objective, behavioural records of student activity. To measure playtime, unique playtime and replay time, a logging instrument was added in 'Graasp' that captured students' time-stamped actions on the video. From the moment the video started playing, every second was logged. Two types of measures were computed: relative time and absolute time.

Relative time. The viewing duration is calculated based on the percentage of the total numbers of seconds of a video, with the length of the video serving as the baseline. An example is the following: when 168 seconds of a video during 208 seconds were played, this resulted in a score of 80,7% (168/208). Playtime (i.e. commitment) consisted out of the total length of time (in seconds) that the video was played and replayed, e.g. a student could play 70% for the first time and replay 20% of the video, resulting in a play score of 90%. The nonoverlapping play moments for the video refer to unique playtime (i.e. coverage), for example: when 100 seconds of the video were watched (208 seconds), and a part of the video was replayed, only 100 seconds were distinctly played. When the unique play rate equals 100% it indicates that every distinct video second was played at least once. Replay time refers to the number of seconds of the video that were played again (converted to a percentage). For this measure, it was interesting to investigate if there is a significant difference between the experimental and control group.

Absolute time. This measure refers to the total number of seconds that a video was played. The total playtime equals all played and replayed seconds. Unique playtime refers to all seconds that were distinctly played. As an example, when a student played all ten minutes and three seconds of the video, and she replayed one minute, her total playtime score would be eleven minutes and three seconds, whereas her unique playtime score would be ten minutes and three seconds. Replay time was the number of seconds that were played again.

Self-efficacy and self-regulated learning. A paper questionnaire based on the guidelines of Bandura (2006) was used to measure self-efficacy and it was redesigned to specifically focus on the domain of agriculture. The questionnaire consisted out of eight questions about the students' perceived competence about the learning domain (e.g., 'How good are you at explaining what an arable farmer does?' and 'How good are you at explaining how a farmer gets food for his animals?'). Students could indicate their response on a seven-point Likert scale with values ranging from very well (1) to very poorly (7). During data preparation, the scores were reversed to make them easier to read. The minimum score was one, and the maximum score was eight. The last step in data preparation was converting the scores into percentages. Please see Appendix J for the self-efficacy questions.

Educational potential of reviews

To support students' judgments, a corresponding smiley scale was inserted above the questions to accurately reflect the attitude of students toward the construct that is being measured (Reynolds-Keefer, Johnson, Dickenson & McFadden, 2009). After counting the points a student has achieved, this score was converted to a percentage. The scores were reversed in computing mean scores. Cronbach's alpha was used to determine the reliability and showed a Cronbach's alpha of $\alpha = 0.620$ for the pre-test. For the post-self-efficacy test, Cronbach's alpha was $\alpha = 0.643$.

To measure self-regulated learning, an adapted version of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & Smith, 1993) was used which is previously used in the study from Van der Meij and Krooshop (2019). This questionnaire is constructed according to the guidelines of Bandura (2006) and Zimmerman (1990). There were 6 items in total asking about the student's perceived competence in the domain of (meta)cognition and resource management (e.g., 'How good are you at planning?' and 'How good are you at checking your work?').

As with the self-efficacy test, a seven-point Likert scale was used where students can indicate their response. The same scoring procedure was followed as with the self-efficacy questionnaire, with a maximum score of six (100%). Reliability analysis using Cronbach's alpha showed an acceptable result ($\alpha = 0.756$). Please see Appendix K for the self-regulation questions.

Knowledge tests. Two knowledge tests were developed in order to measure knowledge gain, namely, an immediate domain knowledge test and a delayed domain knowledge test.

The following process is followed in order to develop the knowledge tests. First, SLO goals are distracted that fit the content of the video. Second, based on the selected goals, five learning goals for the video are developed. Third, a concept map (see appendix G) is made from the content of the instructional video ensuring a proportionate distribution of subjects. In this way, the assessed content will be aligned with the theory discussed in the instructional video. These three steps contribute to the validity of the knowledge test. Furthermore, while developing the test, Bloom's Taxonomy (Jones, Harland, Reid & Barlett, 2009) is used as a way to ensure that all questions do not require the same type of cognitive processing. In addition, the checklist about validity and reliability from Van Berkel and Bax (2006) was used as a guideline to optimize the knowledge test.

Besides the above-described process, the guidelines from Hartley, Goldie and Steen (1979) are taken into account for developing the knowledge tests. The authors prepared twelve questions about the text they give to the participants of their experiment. Six questions were about facts that can be derived from the summary and the text (summary questions) and six questions were about facts that can only be found in the text (incidental questions). So, the questions that can be derived from the summary and from the summary and text were about equal.

After designing the test, a primary school teacher and intern at Cito was asked for expert appraisal on the knowledge tests and she gave advice about the way of questioning for this target group. Her feedback was used to optimize the knowledge tests.

Immediate post-test. The knowledge test consisted out of eight questions which can be found in appendix H. Three questions were ‘remember’ questions, four questions were ‘understand’ questions and one question was an ‘apply’ question. An illustration of a ‘remember’ question is: ‘Name three crops from agriculture’. ‘Why are farms needed?’ is an illustration of an ‘understand’ question and an illustration of an ‘apply’ question is ‘How is silage made?’.

Five of the eight questions can be abstracted from the presented reviews. Per question, a predetermined amount of points can be achieved. The scoring of items is based on a carefully designed codebook (please see Appendix H). As an illustration for the question ‘How is silage made?’: two points are awarded when the student answers one of the following options: 1) The grass is laid on a large pile and is pressed together, 2) Cut a lot of grass and put it under a tarpaulin. One point is awarded when the student answers one of the following answers: 1) From hay that is pressed together, 2) Pressed grass, 3) From a large pile that is then pressed or 4) Through mountains of grass that have been mowed. The achieved scores were converted into percentages with a maximum of 100%. Reliability analysis showed a satisfactory score of $\alpha = 0,64$.

Delayed post-test. Another test than the immediate post-test (see Appendix I) was used but the difficulty was comparable. The number of items and the scoring system was identical. Two questions were ‘remember’ questions, four questions were ‘understand’ questions and two questions were ‘apply’ questions. Two items of the immediate post-test were repeated, namely: ‘How often is a cow milked per day?’ and ‘Why do cows nowadays give more milk than in former times?’ Four of the eight questions can be abstracted from the presented reviews.

Students' opinions. Semi-structured interviews were conducted to gain insight into the students' experience with the instructional video. The students are given a consultative role because reviews are not commonly presented in instructional videos (Van der Meij et al., 2018). Students in both the experimental group and control group will be interviewed since this allows a comparison between the two groups. The interview data can serve to compare the quantitative data and the qualitative data, for example, the data on the knowledge test and students' appraisal of the instructiveness of video can be compared.

Questions were asked to the students about their general appreciation of the video and about the instructiveness of the video (cognitive value). The interview started with an introductory question about the instructional video itself. Two standard questions were used but the interviewer used probing questions to clarify students' answers regarding the targeted outcomes for this study. When administering interviews with elementary school students it is important to align with their needs (O'Reilly, Ronzoni & Dogra, 2018). During the interviewing, there was specially attended to the needs of eight- to ten-year-olds, see Table 6 for the considerations. The subsample of eight students was selected by means of purposeful stratified sampling. Four students from the experimental group and four students from the control group were randomly selected, see Appendix L for the interview questions.

Table 6

Considerations interviews with elementary school students (Baarda & Van der Hulst, 2017; O'Reilly et al., 2018)

Consideration	Explanation
The setting where the interviews are administered	Another room than the classroom was chosen because then students do not feel obliged to give the 'right' answer. Also, the students were interviewed in a casual setting which was familiar to them.
Use paraphrasing	This allows the student time to reflect and think about their answer
Use probing	Probing is used to give students the opportunity to expand their answers and give reasons behind their answers
Sit at the student's eye level	Dynamics are correct; making sure that the researcher and participant are equal to each other

3.5. Procedure

Before data was gathered, the ethics commission of the University of Twente was asked for permission. The teachers were informed about the purpose of the study and indicated that parents gave passive ethical consent when they enrolled their child on the particular primary school. The measurements and interviews were conducted during school hours in the students' own classroom. Every student sat at their own table with a chrome book, earplugs or headphones, a pencil, an eraser and a reading book.

In the first meeting, the researcher introduces herself shortly and then gives instructions about the experiment. It was instructed that the booklets can only be opened when it is indicated by the researcher. In addition, the students were not allowed to consult each other and they had to make the assignments in the booklets individually. Furthermore, it was emphasized that the assignments in the booklet were not intended as a real test. There were timeslots for the assignments (five minutes for the self-efficacy and self-regulation questionnaire, three minutes for the post-self-efficacy questionnaire, 15 minutes for the knowledge tests), so when students were not ready in time, they had to stop and lay down their pencil. When students were finished earlier they were instructed to read in their own reading book. Lastly, it was instructed that when students arrived at the video they had to watch it with earplugs to not bother others. See Appendix M for the complete instructions that were given.

Next, two booklets are handed out to the students as a guide to appropriately follow the experiment. Students could only ask for help when there was a technical problem. The first booklet

Educational potential of reviews

started with a self-efficacy questionnaire and a self-regulation questionnaire (five minutes). After five minutes, students followed the instructions in the first booklet where it was indicated that the students have to enter the website 'Graasp' to watch the video.

Before the experiment, the half amount of the chrome books were set up with the website for the experimental group and the half amount of the chrome books were set up with the website for the control group. Students had to log in with the number which was displayed in their booklet. In this way, anonymity was ensured and students would not use the same login number. While watching the instructional video, user logs were administered. Students had 20 minutes in total to watch the instructional video. After watching the video, the second booklet was handed out which contained a self-efficacy questionnaire (three minutes) and the immediate post-test (15 minutes). The whole meeting will last for approximately 50 minutes.

After two weeks, a second meeting was planned. During this meeting, a delayed knowledge test (15 minutes) was administered which was provided in the third booklet. Afterwards, four students were randomly chosen (after stratification for gender) from the control group and experimental group to participate in an interview. It was ensured that an equal amount of students from the control group and the experimental group were interviewed per school. From every school, four students were interviewed resulting in eight participants. The duration of the interviews was approximately five to ten minutes.

Subsequently, the teacher was thanked for her collaboration by receiving a candle and the students were thanked for their participation by receiving gums of agriculture products and a poster about the instructional video. Beforehand, the teacher could have indicated to receive a report with important findings for her class. In addition, a special infographic was developed for the participating students because they also indicated to be interested in the outcomes of this study.

3.6. Data analysis

This paragraph describes the analysis of quantitative and qualitative data. The paragraph starts with a description of the analysis of the dependent variables (engagement, self-efficacy, self-regulation and recall). With all analyses, two-sided tests with alpha set at 0.05 are used to report on significance. Finally, it will be explained how the qualitative data will be analysed.

Engagement. The effect of reviews on engagement will be analysed by comparing the playtime, unique playtime and replay time between the experimental and control group. As described in the methods section, a user logging method is used to measure engagement with the instructional video. The data is extracted from the video engagement tool in the program ‘Graasp’. The assumptions on the normality of distribution and homogeneity of variance were tested and revealed that there were violations for normality and/or homogeneity of variance. Therefore, non-parametric tests are reported for these measurements (i.e., Mann-Whitney *U* test and Wilcoxon Signed Rank Test).

Motivation. The effects of reviews on self-efficacy scores will be analysed by comparing the mean scores between the experimental and control group over time (i.e.: the self-efficacy before test and the self-efficacy after test). There were no violations of the data on self-efficacy and self-regulation. Therefore, a repeated-measures analysis of variance is performed. Assumptions on sphericity are assumed because there are only two variables. Regarding self-regulation, it is hypothesized that reviews can compensate for a lack of cognitive strategies. ANCOVA analysis was conducted to determine a statistically significant difference between the experimental and control group on the scores on the post-knowledge test and the delayed-knowledge test by controlling for self-regulation.

Recall. In order to perform inferential analyses on this dataset, the data is prepared as previously described. For the knowledge tests, a repeated-measures analysis of variance is performed to see whether there were differences (over time) in the knowledge test scores between the control group and the experimental group. Assumptions for homogeneity are met using the Kolmogorov-Smirnov test and the assumptions for variance are also met. Assumptions on sphericity are assumed because there are only two variables. Based on the analysis, conclusions can be made whether the student who watched the review video had higher, lower or equal test scores in comparison with a student who watched the ‘segmented’ instructional video.

Participants opinion. The interviews were recorded and transcribed in order to make the data analysis more reliable. Then, the raw data is read in detail so that the researcher is familiar with the content. After close reading, codes are used to determine if there are any patterns and whether these patterns differ between the experimental group and the control group. Since the nature of this research is exploratory, the focus will be on inductive coding which will be inspired by Thomas’ (2003) approach. Categories of codes are directly derived from the data in correspondence with the aims of this research. After coding the interviews, a code-document table is extracted from Atlas.Ti in order to compare the responses from the control group and experimental group in more detail.

4. Results

This chapter comprises of analysis results. First, the quantitative data will be presented starting with data regarding engagement, followed by data concerning self-efficacy and self-regulation. In the third section data regarding the learning outcomes is presented and subsequently, the qualitative data from the interviews are described.

4.1. Engagement

The paragraph starts with the presentation of the relative measures (i.e., the percentage of the engagement time) for the original instructional video and review video. What follows is the presentation of play data (i.e., the amount of time participants engaged with the video) for both videos. Table 7 shows the mean percentages of scores and standard deviations on unique play, play and replay and Table 8 shows the corresponding relative measures.

Relative measures. Unique play shows a high percentage of played video time in both conditions, namely 99.21% of the instructional videos were viewed. The Mann-Whitney test on the relative play rate showed no significant differences between the conditions ($U= 131.0$, $p= 0.832$). For the measures on unique relative play, Mann-Whitney showed no significant differences ($U=89.0$, $p= 0.089$). Replay was low, it namely had a mean percentage of 0.80% ($SD= 3.17$) and there were no significant differences found ($U= 184.0$, $p= 0.81$). It is therefore not used for further analyses.

Table 7

Relative mean percentages of scores and standard deviations on unique play, play and replay

Condition	Unique play		Play	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Instructional video ($n = 18$)	98.48%	3.61%	106.43%	16.12%
Review video ($n =21$)	99.86%	0,85%	103.89%%	6.26%
Total ($N=39$)	99.21%	2,57%	105.06%	9.96%

Absolute measures. Mann-Whitney showed that the unique play rate did not differ between the two types of videos ($U= 142.5$, $p= 0.152$). The results for play also showed that the play rate did not differ between the different conditions ($U= 181.5$, $p= 0.832$). On average among both conditions, only 7.92 seconds of the video was replayed and there were no significant differences found between the groups ($U=176.0$, $p= 0.560$). For the same reason as with relative measures, the replay data is not used for further analysis.

Table 8

Absolute mean percentages of scores and standard deviations on unique play, play and replay in seconds

Condition	Unique play		Play	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Instructional video (<i>n</i> = 18)	948.50	34.75	1023.89	126.18
Review video (<i>n</i> = 21)	962.71	6.98	999.38	60.20
Total (<i>N</i> = 39)	956.15	24.85	1010.69	95.83

4.2 Self-efficacy and self-regulation

The mean score of self-efficacy before watching the instructional video was 4.92 (SD= 0.94) which is slightly above the scale mean (the mean scale value is four). After participants watched the instructional video, the mean score dropped to 4.83 (SD=0.92), however, it was not statistically significant. The overall test for differences in means in the repeated-measures ANOVA was not significant $F(1,37)$, 1.85, $p=0.17$. There was no main effect of condition $F(1,37)$, 0.58, $p=0.451$, and there was no interaction effect found between time and condition $F(1,37)$, 0.87, $p=0.87$.

Table 9

Mean scores and standard deviations for self-efficacy before and after watching the instruction video and for self-regulation

Condition	Self-efficacy before		Self-efficacy after		Self-regulation	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Original video (<i>n</i> = 18)	5.06	0.99	4.94	1.00	5.2	1.18
Review video (<i>n</i> = 21)	4.82	0.91	4.73	0.84	5.11	1.23
Total (<i>N</i> = 39)	4.92	0.94	4.83	0.92	5.19	1.20

Note. The range of the scores is 1 to 7; a higher score means a higher perception.

The mean score on self-regulation was 5.19 (SD= 1.20), for the control group the mean score was 5.2 (SD= 1.19) and for the experimental group 5.11 (SD= 1.23). After testing the assumptions, an ANCOVA is computed for the post-knowledge test scores and the delayed knowledge test scores with self-regulation as a covariate. The assumption for homogeneity of regression was not met, however

when a moderation effect is expected this assumption is of less significance. The ANCOVA analysis revealed that there was no significant effect of condition on post-test scores and delayed knowledge test scores after controlling for self-regulation scores with $F(1,37) = 1.61, p = 0.21$.

4.3. Learning outcomes

A two-way ANOVA was conducted to see whether age or gender predicted the test scores. Age is not significantly related to the post-test score ($F(1,37) = 1.78, p = 0.171$) and to the delayed knowledge test score with $F(1,37) = 0.40, p = 0.76$. Gender is also not significantly related to the post-test score ($F(1,37) = 0.57, p = 0.46$) and to the delayed knowledge score with $F(1,37) = 0.23, p = 0.64$.

Table 10 shows the results for the knowledge test outcomes. The level of performance was generally low on the immediate post-test (39.13%) and the delayed post-test (38.80%). The overall test for differences in means in the repeated-measures ANOVA was not significant, so no main effect of time was found with $F(1,37) = 0.217, p = 0.644$. There was no main effect of condition ($F(1,37) = 0.05, p = 0.815$) and there was no interaction between time and condition with $F(1,37) = 0.93, p = 0.341$.

Table 10

Mean percentages of correct scores and standard deviations on test measures

Condition	Immediate post-test		Delayed post-test	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Original video (<i>n</i> = 18)	41.03	21.42	38.98	27.45
Review video (<i>n</i> = 21)	38.46	20.03	44.34	20.99
Total (<i>N</i> = 39)	39.64	20.45	41.86	24.00

4.4. Interviews

The results of the interviews will be described in this paragraph. The privacy of the interviewees are protected by using pseudonyms. Four participants from the control group (Lola, Nico, Dorinda and Jos) and four participants (Bas, Britt, Tobias and Rosalie) from the experimental group were interviewed. Both groups included two boys and two girls and they were eight or nine years old. The chapter starts with the general appreciation of the interviewees' experience from the instructional video. Then the instructiveness of the video is discussed with a focus on recall strategies.

For both the general appreciation and cognitive value, comparisons are made between the experimental and control group. To make the results insightful and the data comparable, a data matrix is used, which is displayed in Table 11. The data matrix is an overview of the classification (in this

study on the Likert scale) from every participant regarding the targeted dimensions of a study (i.e. general appreciation and cognitive value) (Galtung, 1967).

Table 11

Classification of scores from the interviews

Participant		Cognitive value score	General appreciation score
Bas	experimental	7	5
Britt	experimental	6	5
Rosalie	experimental	6	4
Tobias	experimental	3	5
Lola	control	7	6
Nico	control	6	5
Jos	control	6	5
Dorinda	control	1	1

Note. A higher score means a higher appreciation

General appreciation. In general, interviewees indicated that they liked the video. Most interviewees gave a value score of five. The scores in the experimental group ranged from four to five and the scores in the control group ranged from one to six. Britt (experimental) gave a five because *'it was okay to watch'* and Lola (control) gave a corresponding reason for score five: *'It was just normal, just good. Just not very happy (i.e. the laughing smiley at seven) but just normal.'*

What was striking is that two interviewees indicated that they liked the video because of the cognitive value. Britt explained (experimental): *'You could learn from the video and learning is good'*. Lola (control) said: *'It was about former times and what they did then and it was very informative'*. Bas (experimental) also pointed out that he liked the video because he learnt a lot: *'Uhm, that I started to know more about agriculture because I didn't know much about it yet, but that's why I do a five because I also learnt a lot.'*

Additionally, Lola (control) also liked the video because of the topic: *'I came to know what farmers did in former days and which animals they can have and so on. And also vegetables and fruit or as to how they did it in former days. And yes, I find it very special, actually and especially from former days'*. Bas (experimental) confirmed this argument because he liked that he came to know more about agriculture. Britt (experimental) added that she also finds the video nice because it was funny: *'I found it kind of funny how they turn on the milking machine because that is quite a weird system'*.

Three interviewees said that they liked the video because it showed how things are working. Nico (control) explained: *'I liked to see that the cows have to go somewhere, that they know that. And that they are milked there'*. Jos (control) also confirmed this: *'that they were going to do at the farm,*

that, um, that milking'. Also, Tobias (experimental) confirmed that he gets insight into how things are working at a farm.

There were also several reasons why the video was less fun according to the interviewees. Britt (experimental) indicated she was sometimes bored while watching the video because she did not feel like she had to watch it. More information would make the video nicer according to Britt. Bas (experimental) pointed out a relatable suggestion: *'Start immediately talking and don't show things first and then talk'*. He indicated that he wanted to get more explanations at the start.

A connection can be drawn to what Rosalie (experimental) suggested, namely making the video easier because she finds it too difficult, mainly the part about how things are going on a farm. More explanations could be a possible solution according to Rosalie. Other reasons from some interviewees from the control group for not liking the video were that the video was too long and outdated.

Besides, suggestions about the content, interviewees gave some suggestions from a technical point of view. Dorinda (control) suggested to improve the image quality of the video and Jos (control) suggested improving the audio quality of the presenter. Despite the suggestions for improvements, interviewees had a positive attitude towards the video, such as the interest in the topic which is a determiner for motivational engagement (Hoffman & Nadelson, 2010). This finding is in line with the high coverage scores measured with the user logs.

Cognitive value. Generally speaking, the interviewees agreed that the video taught them new knowledge. A value score of six is most often chosen. The scores in the experimental group ranged from three to seven and the scores in the control group ranged from one to seven. What was striking is that Britt (experimental) said: *'I find the video informative because I did not know barely anything about agriculture. Because of the video, I could perform more, better. I actually liked that'*. Lola (control) also indicated to have learned a lot: *'because I did not know a lot of things and stuff. Also how they did it in former times. I did not know that at all and I really did not know that cows could go the machine by their selves'*. However, Dorinda (control) indicated to have not learned anything and said: *'I knew it all'*.

Recall strategies. Two interviewees could explain what kind of recall strategy they used. Britt (experimental) explained: *'When there were fewer images I made an image in my head myself wherethrough I understood the content more thoroughly'*. That was practical for me'. Lola (control) said: *'Some parts of the video I played again'*. Contradictory, Nico (control) did not use any specific recall strategies. He explained: *'I find the video just easy. I quickly remember things from myself'*. He added, that he likes the explanations in the video. Bas (experimental) confirmed the value of explanations: *'There is information and then it is explained how everything is going'*.

Tobias (experimental) had another opinion about recalling things from the video: *'Some things I did not know, actually, but you actually forget it afterward'*. His explanation for quickly forgetting things was that the video was maybe too fast. He also would like to have more repetitions in the video.

Taken together, it appeared that no interviewee described the review as an aid to recall the information which might explain why the effect of reviews on learning outcomes is not found.

Improving recall. Interviewees in the experimental group and control group gave different suggestions but they cannot be linked to the (un)presence of reviews. Tobias (experimental) pointed out that he likes writing so he suggests incorporating a writing exercise in the video. A connection can be drawn to what Lola (control) says: *'I can also write it down. From what she says and then you can repeat it. Because from reading you can also remember much.'* Tom (experimental) also would like to have questions in the video or the opportunity to give your opinion. He also suggested incorporating PowerPoints or posters in the video.

Rosalie (experimental) found the video a little difficult: *'I did not understand it quite well'*. When the video will become easier she thinks she will learn more from it. Bas (experimental) wants to have immediately explanations at the start of the video instead of an introductory part. Nice (control) would like to have overall more explanations, for example about the milking machine.

5. Conclusion and significance of findings

The present study investigated how reviews in instructional videos teaching declarative knowledge could affect motivational outcomes and learning outcomes. To answer the research question, the insights from the theoretical framework will be compared with the results of the current research. First, the sub-question about the effect of reviews on engagement scores will be answered. What follows, is the discussion about self-efficacy and self-regulation. After that, the effect of reviews on learning outcomes is discussed. Lastly, the learning experience from the interviewees is linked to the results of the experiment. After answering the research questions, implications are given and the limitations of this study are described followed by suggestions for future research.

5.1. Engagement

The findings showed that both videos received good coverage scores which means the video was played and potentially viewed by the participants. The high unique play rate score of 99.21% indicates the participants find the video informative to play.

It was expected that the review might activate participants to replay the video but no significant difference was found between the conditions. One explanation for why most participants did not replay the reviews could be that the participants did not know how to use the reviews since they are not common in existing educational videos (Van der Meij et al., 2018). It is striking that the reviews were also not mentioned by the participants in the interviews.

Further, it was hypothesised that the coverage scores for the review video would be significantly lower than for the video without reviews, however, no significant differences were found. It can be seen as a positive finding since engagement is a prerequisite for processing the instructional video (Guo et al., 2014). Altogether, the coverage scores were high for both conditions which might be

explained by several factors. First, the instructional video is aligned with the personalization principle (Mayer & Mayer, 2015), for example, by using a conversational tone and showing the farm by a peer. This might have the consequence that the students feel personally engaged with the video. In the interviews, Britt (experimental) said: *'I find it funny that, uhm, that girl sat down in the cart with the boy. And I just liked that'*.

Second, interest in the topic might have led to high engagement scores (Moshabab, 2017). When students have a positive belief about the topic they are more likely to cognitively engage in the task (Wang & Eccles, 2013). Almost all interviewees indicated that they liked the topic of agriculture. When students determine if they will engage in a task they make considerations based on interest and task challenge (Hoffman & Nadelson, 2010). The balance between these factors determines the strength of the engagement. When a student is deeply engaged she is committed to watching the instructional video and has a willingness to finish watching (Fredricks et al., 2004)

Third, a few interviewees also named the task value as a reason for liking the video. The value students attribute to a learning task can influence their likeliness to engage in a task (Cole, Bergin & Whittaker, 2008). In the interviews, the task value is frequently mentioned. For example, Britt (experimental) said: *'You could learn from the video and learning is good'*. Some interviewees also indicated that they liked it that it was shown how things work at a farm. In this way, a connection is made to everyday life, therefore this could be linked to the instrumental value which is a determiner for students' likeliness to engage in a task (Blumenfeld, Kempler & Krarjck, 2006).

Lastly, the age of the students may have led to high engagement scores. To be more specific, the intrinsic motivation from students in grade three to four is in general higher than from students in grade eight (Lepper, Corpus & Iyengar, 2005). It is possible that the students were intrinsically motivated to help the researcher and wanted to do well in the experiment. They also indicated to be interested in the research itself. Thereby, the video and content were new for them which might have positively influenced their viewing behaviours (Van der Meij, 2017). Additional engagement measures could lead to more comprehensive insights, for example by capturing disengaged behaviour based on time sampling and facial expression (Azevedo, 2015).

5.2 Self-efficacy and self-regulation

It was expected that the review would enhance self-efficacy in the experimental condition. Nonetheless, contrary to the expectations the mean self-efficacy scores were lower than before watching the video. The difference was not statistically significant and for both conditions, the mean self-efficacy score remained above the scale mean of four.

Contrary to the quantitative findings, the answer from Lola from the experimental group indicated an increase in self-efficacy. Lola (experimental) indicated that she could perform better through the video and that she liked that. Her answer can be linked to an increase in self-efficacy because of the belief in herself for having enough knowledge to perform on the knowledge tests seems

to have increased (Bandura, 1997). There are some potentially influencing factors that could explain why the effect of self-efficacy is not found in the experiment.

Notably, the learning environment and experimental setting were new for the participants and were not used to watching videos without the guidance of the teacher. According to Woolfolk (2014) and Bandura (1994), the support of the teacher is one factor that stimulates self-efficacy. For example, the participants did not receive encouragement or informal feedback from the teacher during the experiment. These notions together are known as social persuasion and positively contribute to self-efficacy development (Bandura, 1997; Schunk, 1990).

Moreover, students may have lacked the introspective ability to assess their self-efficacy (development) accurately. From research on the development of students' own understanding of the mind is known that the ability of introspection is not yet fully developed for the target group of this study (Flavell, Green & Flavell, 2000; Schunk, 2005; Vandebussche, 2010). When students lack these skills it may give incongruent self-efficacy scores.

The relation between self-regulation skills and the need for reviews. Self-regulation skills are needed for effectively processing a video (Merkt et al., 2011; Sun et al., 2017). As hypothesized, a review can serve as a guide to engage in the right mode of cognitive processing when a student has fewer self-regulation skills. However, contrary to the expectation there was no moderation effect found of self-regulation scores on the knowledge test scores between the different conditions. For the control group, the positive effect of self-regulation on learning outcomes was not found which is in contrast with findings from empirical research (Bandura, 2006; de Boer et al., 2013; Zimmerman, 1990). Therefore, more research has to be devoted to investigating how students from eight to ten years old can benefit from their self-regulation skills while watching an instructional video.

The effect of self-regulation was also not found in the experimental group. One explanation could be that the review focuses on cognitive strategies which tend to have a smaller effect than instructional tools focusing on metacognitive strategies (de Boer et al., 2013). The review could assist the student in the processes of rehearsal and organisation, which are both part of cognitive strategies (Kostons, Donker & Opdenakker, 2014). Metacognition relates to how, when and why a particular learning strategy can be used. In the instructional video, there are not any instructions incorporated about the use of the review targeting metacognitive knowledge.

A connection can be made to a finding from the interviews. No interviewee mentioned the review in the interviews as an aid to recall information, so it could be that the participants did not know how to use the review which relates to metacognition. Instructions targeting self-regulation skills are in general less effective with younger students because they do not know how to use learning strategies (de Boer et al., 2013; Schunk, 2005). When students do not have the metacognitive knowledge about how they should use the review, it can also not contribute to higher learning outcomes. Explicit instruction on the metacognitive level may assist young students in using the review as intended by engaging in the targeted information processing (De Boer et al., 2013; Dignath

& Büttner, 2018; Veenman, 2011). For example, before the presentation of the reviews, the students could be informed about what the goal of the review is and how they can use the review.

5.3. Learning

As was shown in the theoretical framework, there is no empirical consensus about the effect of reviews in instructional videos teaching procedural knowledge (Van der Meij & Dunkel, 2020; Van der Meij et al., 2018; Brar & Van der Meij, 2017; Van der Meij, 2017; Van der Meij & Van der Meij 2016 a,b). However, for text, the effect of summaries on the recall of content is already proven (Hartley, Goldie & Steen, 1979; Hartley & Trueman, 1982; McLaughlin Cook, 1981). It was expected that the participants who watched an instructional video with reviews would have significantly higher scores on the knowledge tests in comparison with participants who watched an instructional without reviews.

One important side note is that there was no pre-test administered to ensure that there were no differences in prior knowledge about agriculture at the start. As a result, this study can only give information about the relative effectiveness of the two conditions. Despite this, in the current research, no significant effect of reviews on learning outcomes (overtime) was found. Participants in the control group had a slight decrease (from 41.03% to 38.98%) in their absolute scores after two weeks (i.e. on the delayed post-test). In addition, the participants in the experimental group had a slight increase (from 38.46% to 44.34%) in their absolute scores after two weeks. However, it is striking that the absolute scores are rather low. An explanation could be that the students were not used to answering open questions.

In general, the interviewees indicated to have gained knowledge from the video. As mentioned in the previous section, no interviewee described the review as an aid to recall information. However, it has not been investigated in what kind of information processing the student engages in while watching the video (for example, by means of think-aloud-protocols), so no strong conclusions can be made on whether the review is used by the participants.

There are some characteristics of this research that might explain why the effect of reviews on learning outcomes is not found. This could be due to 1) the unusual presentation, 2) the focus on textual information in the review, 3) the pace of the video, 4) opportunities for active processing of the content. First, reviews are not commonly presented in instructional videos for students in primary school. It may be that the students thought that something was wrong with the video when the review was presented (Michel & Roebbers, 2008). As a consequence, they may not have paid full attention to the review. Related to this, it could be that the students did not notice the connection with the video, so they did not know that the review was part of the video. When students have to mentally integrate sources of information this can hamper learning which is in accordance with the split-attention principle (Ginns, 2006). By inserting a review that combines visual and verbal information an integrated format is assured by using visual scenes from the video.

Educational potential of reviews

Furthermore, visual-verbal redundant information in reviews provides more cues for later recall (Mayer & Mayer, 2015; Michel & Roebbers, 2008). For example, images from the video could be added in the review while aligning with the spatial contiguity principle. This is in line with Mayer & Mayer's (2015) multimedia principle which states that people learn better from words and pictures than words alone. The rationale is that information that is processed in only one code (i.e. visual or verbal) provides fewer cues for later recall.

Additionally, the pace of the video might have been too fast which was mentioned by a participant in the interviews. When the pace of the video is too high, this can result in a higher cognitive load, increasing working memory demands. From research is known that pauses are beneficial for learning outcomes because it gives the student additional time to engage in the right cognitive processes by reducing transience (Hasler, Kersten & Schweller, 2007; Mayer & Chandler, 2001; Spanjers, Van Gog, Wouters & Van Merriënboer, 2012). In this way, the cognitive load is reduced.

Further, the interviews point to some improvement points in order to engage in the active processing of the learning content. Tobias (experimental) and Lola (control) both point to the possibility to write things down during the video. Additionally, Tobias (experimental) points out that he would like to have questions in the video or the opportunity to give his opinion. Questions may enhance the students' recall of important information and their ability to use the recalled information (Brame & Biel, 2015). It could be an interesting path for future research to test the effect of questions and reviews in an experimental setting with four different conditions: a) review only, b) questions only, c) control, d) review and questions.

5.4. Students' learning experience

Reviews are not commonly presented at the end of instructional videos (Van der Meij et al., 2018). Therefore, this research investigated how students value the instructional video with reviews versus the instructional video without reviews. The interviewees generally appreciated the instructional video about agriculture and were positive about it. They also indicated to have gained knowledge about agriculture but except for two interviewees, the interviewees could not describe how they gained knowledge from the video. One participant from the experimental group used a recall strategy but the review was not used as an aid for recalling information.

General appreciation. In the experimental group, interviewees gave a score of four or five (on a scale of seven) for how much they liked the video. In the control group, interviewees gave a one, five or six for liking the video. The reasons both groups gave for their likeability scores were the cognitive value of the video and because they liked the topic. In addition, the video gave the interviewees insight into how things work on a farm which they liked. On the other hand, there were also several points which make the video less fun.

Reasons in the experimental group were: being bored and the high level of difficulty of the video. Two interviewees in the experimental group said they would like to have more information in the video. Reasons for not liking the video were different in the control group, namely, one participant finds the video too long and another participant finds the video outdated. Besides, three interviewees in the control group have improvement points from a technical point of view. However, these reasons could not be directly linked to the (un)presence of the review in the video.

Cognitive value. In the experimental group, the interviewees gave a score range of three, six or seven for the instructiveness of the video. For the control group, there was a greater range, namely interviewees gave a score of one, six or seven. However, in general interviewees from both groups indicated to have gained knowledge. Only one participant from the experimental group and one participant from the control group indicated to have used a recall strategy. One participant from the experimental group gave an explanation for why he might have quickly forgotten things: the video was too fast and he would like to see more repetitions. Two interviewees (control and experimental) suggest having more opportunities for the active processing of the content. Anyhow, no interviewee mentioned the review in their answers. It was expected that the review might facilitate information processing leading to higher recall outcomes. When the review is probably not used by the interviewees it can also not lead to higher learning outcomes.

Theoretical and practical implications

The current study used empirical research about summaries in texts to examine the concept of reviews in an instructional video. A preliminary definition of how reviews would look like in an instructional video teaching declarative knowledge is proposed. Thereby, guidelines for the development of reviews are advanced based on the QuickScan guidelines and content guidelines for making a text summary.

Scholars had already advanced hypotheses about the beneficial effect of reviews on self-efficacy and learning outcomes. The current study suggested the possibility that self-regulated learning skills could also be stimulated by incorporating a review. Using cognitive strategies (which were expected to be facilitated by the review) would lead to more diligently processing the video which in turn would have a positive effect on learning outcomes. No moderating effect of self-regulation skills was found, however, suggestions are given for precisely aligning to theories about self-regulated learning while developing a review. Along these lines, a more coherent conceptual framework

Educational potential of reviews

incorporating the expected cognitive and motivational effects of reviews could take shape in order to test the predictions about reviews in a systematic way.

Limitations & future directions

To improve the methodological quality of this research, the knowledge tests could be optimised by adding more questions in every category of Bloom's taxonomy (i.e. remember, understand and apply). Due to the time restrictions of this research and the limited attention span of this target group this was not possible. Nonetheless, by adding more questions a reliability score can be calculated per category, namely the categories: remembering, understanding and applying. In this way, it can be made sure that the questions indeed measure different kinds of cognitive processes. Besides, the mean scores on the knowledge tests are below 50% which suggests that the items were too difficult for the participants. It could be considered to construct items that measure the same content but are less complex.

Future research could consider developing an instructional video by using instructional theories instead of using an existing video. The advantage of developing an instructional video is that there can be controlled for the content and design of the video, improving the instructional quality of the video. As a result, a conceptual framework attending to the enhancement of learning outcomes and self-regulation skills can form the foundation for the development of the video (Schacter & Szpunar, 2015). For example, as mentioned by two interviewees, including opportunities for active processing of information such as inserting questions, can benefit learning outcomes. Also, there can be attended to the influence of seductive details on recall by using relevant theories such as the Cognitive Theory of Multimedia Learning from Mayer and Mayer (2015). Moreover, more explicit attention could be paid to the self-efficacy theory in the design of the video when a new video is developed.

As stated in the introduction, videos are increasingly used in education and therefore have to be adequately designed by aligning to the way the human mind processes information (Mayer & Mayer, 2015). Reviews in videos teaching procedural knowledge have been investigated in an experimental setting but no consensus has yet been reached about its effects. One study found an effect of reviews on learning outcomes using an instructional film teaching declarative knowledge. The current study incorporated novel features: 1) the reviews were based on guidelines, 2) the comparison with a segmented video) to explore the effect of reviews on engagement, motivation and recall. However, the quantitative results were not in line with the expectations. Results imply that the provision of reviews, in comparison with the possibility to additionally process the information through inserted segments, does not lead to significantly higher learning outcomes. Since videos are becoming an important learning source, it is critical to investigate ways to effectively process an instructional video and identify which specific features of an instructional video positively impact students' outcomes.

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Appendix A:

Link to the videos and booklets

The videos can be viewed by clicking on the following links:

Control condition: <http://bit.ly/akkersenweilandenschooltv>

Experimental condition: <http://bit.ly/AWgraasptv>

The whole booklets can be viewed by clicking on the following links:

Booklet 1 (meeting 1, before watching the video): http://bit.ly/booklet1_MA_Yvonne

Booklet 2 (meeting 2, after watching the video): http://bit.ly/booklet2_MA_Yvonne

Booklet 3: http://bit.ly/Booklet3_MA_Yvonne

Appendix B

Learning goals of the video based on SLO goals.

<p>Core objective 47:</p> <p>‘Students learn to compare the spatial design of their own environment with that in environments elsewhere, at home and abroad, from the perspectives of landscape, living, working, administration, traffic, recreation, prosperity, culture and philosophy of life.</p>	<p>The students learn about different forms of agriculture.</p> <p>It is explained that that arable farm is concerned with growing crops, such as vegetables, fruit, potatoes, grains and sugar beets. Stockbreeding keeps animals, for example, cows are kept for milk and cheese, pigs for meat and sheep for the wool. A mixed farm keeps animals and is concerned with growing crops.</p>
<p>Core objective 40:</p> <p>‘The students learn to distinguish and name common plants and animals in their own environment and learn how they function in their environment.’</p>	<p>The students learn about the importance of agriculture for food supply.</p> <p>The instructional video explains the process of sowing and reaping sugar beets and that cows are held for the milk. In addition, there is attended to how farmers make food (i.e. hay and silage) for their animals.</p>
<p>Core objective 44:</p> <p>‘The pupils learn to establish relationships between the operation, form and use of materials in products from their own environment.’</p>	<p>The students learn about the functioning of the milk robot.</p> <p>It is clarified that cows are wearing a collar that transmits a unique signal to the computer of the milking robot. In this way, the computer knows almost everything about the cow. Next, it is explained how the milking robot milks the cow.</p>

Educational potential of reviews

<p>Core objective 49:</p> <p>‘The students learn about the global spatial distribution of population concentrations and religions, climates, energy sources and natural landscapes such as volcanoes, deserts, tropical rain forests, high mountains and rivers’.</p>	<p>The students learn about the use of fields.</p> <p>2/3 of the ground in the Netherlands is used for agriculture. They also learn about the distribution of population concentrations, namely that few people work in agriculture.</p>
<p>Core objective 51:</p> <p>‘The students learn to use simple historical sources and they learn to use indications of time and time format.’</p>	<p>The students learn the difference in practicing a profession in agriculture between then and now.</p> <p>Nowadays, a cow is milked by a machine and there are large farmer companies with one product. In former times, a lot of work was done by hand and there were small mixed farms</p>

Appendix C:

Text of the instructional video and reviews

According to the QuickScan guidelines a distinction is being made between minor (yellow text) and major information (green text).

0:00 – 4:20,13

Rondje Nederland. Melk, suikerklontjes, chips en kaas. Zo kan ik natuurlijk nog wel even doorgaan. Al deze producten komen van boerenbedrijven in Nederland. Groente en fruit komen van akkerbouwers die bouwgrond hebben en daar op allerlei gewassen laten groeien en melk en kaas komen van een veeteeltbedrijf dat is een boerenbedrijf dat bijvoorbeeld melkkoeien houdt. En van die melk worden weer allerlei andere producten gemaakt zoals bijvoorbeeld kaas en boter.

Een heel groot deel van de grond in Nederland, wel twee derde deel wordt gebruikt voor landbouw. Op die grond worden gewassen geteeld en op de weilanden worden dieren gehouden maar er zijn ook boerderijen, stallen en kassen die horen ook bij de boerenbedrijven. Er is dus veel landbouwland maar toch werken er niet veel mensen meer in de boerenbedrijven. Van alle 20 mensen die werken in Nederland werkt er maar een in de landbouw. Ze hebben een agrarisch bedrijf, sommige boeren hebben een veeteeltbedrijf daar worden koeien gehouden voor de melk en kaas, varkens voor het vlees of schapen voor de wol.

Andere boeren hebben een akkerbouwbedrijf, ze verbouwen gewassen zoals aardappelen, granen en suikerbieten. Er zijn ook boeren die vee hebben en gewassen telen. Zij hebben een gemengd bedrijf. Bij dit bedrijf worden bijvoorbeeld suikerbieten geteeld. Kijk, dit is nou zo'n suikerbiet. Nou de naam zegt het al een beetje deze bieten worden verbouwd om suiker uit te maken en in de suikerbiet zit heel veel zoete stof. Ze worden hier gezaaid en geoogst en daarna gaan ze naar een fabriek waar ze suiker van maken. Wist je dat van een zo'n biet wel 35 klontjes suiker gemaakt kunnen worden. 35? Ja, pff jeetje wat veel. Hoeveel klontjes suiker denk je dan dat hier ongeveer groeien? Nou, duizenden. Miljoenen. Wow.

In september beginnen de boeren met het oogsten van de suikerbieten. De boer gebruikt daarvoor een bietenrooier. Deze machine snijdt de kop van de bladeren van de biet af en haalt de biet uit de grond. En nu in de herfst in bijvoorbeeld Noord-Brabant zie je heel veel van dit soort

trekkers rijden vol met suikerbieten die net zijn geogst. Ze worden nu namelijk allemaal naar de fabriek gebracht. Ik ben vandaag dus in Noord-Brabant. Even kijken hoor: hier ongeveer. En ik heb afgesproken met Jeffrey en hij woont op een echte boerderij. Zijn vader heeft wel meer dan 100 melkkoeien. En ik ga ze een handje helpen.

- Ons voedsel komt van boerenbedrijven:
- De akkerbouw kweekt gewassen, zoals groente en fruit
- De veeteelt zorgt voor vlees en zuivel (bijvoorbeeld melk)
- In een gemengd bedrijf is er een beetje van allebei

- In Nederland is veel landbouwgrond, maar weinig mensen werken als boer

- Suikerbieten worden in de herfst geogst, daarna wordt er suiker van gemaakt

4:39 – 8:38

Ik mag wel opschieten want over een half uurtje moeten de koeien gemolken worden. Hee, hai, jij bent zeker Jeffrey. Ja, nou, kijk ik heb mijn laarzen aan, ik heb mijn emmer mee dus ik kan beginnen. Had je allemaal niet mee hoeven nemen. Tegenwoordig gaat het allemaal via machine. Deze hoeft niet mee dus? Wat een luxe! Prima. Ik begin al op een echte boerin te lijken. Ja. Ja gaat u maar. Zo. Hier staan de kalfjes. O kijk, nou het lijkt net of deze net is geboren met zijn vachtje zo. Ja. Hoe oud is deze? Bijna twee weken. Bijna twee weken? Is nog echt heel jong. Ja, heb jij ook gezien toen ie werd geboren? Nee, deze niet maar bij een andere wel.

Welke heb je gezien dat die werd geboren? Uh, die. Maar moet deze niet bij z'n moeder staan? Want hij staat hier nu wel, hij is nog heel bang. Nej, die hoeft niet bij de moeder te staan. Nee? Waarom niet? Hij krijgt nu melk van de moeder. Hij krijgt wel melk van de moeder. Ja, 's morgens en 's avonds. En dan gieten we de melk in deze emmer en als je dan hier zo uh, dan komt er buiten melk uit. Oh, dit is net zoiets als een uier. Ja, oeh, er komt nog melk uit. Wat handig! Ja. Sabbelen vinden ze altijd leuk. Kijk al, ik zie al, hallo. Lekker hè? Hee, volgens mij heeft ie dorst. Ja. Moeten we hem niet wat te drinken geven want anders drinkt ie m'n vingers op. Hoh, wat leuk zeg, wonen op een boerderij.

Zo, dit is het echte boerenleven. Zo, hij begint gelijk te hijgen als een gek. Ojee, rustig maar. Dat is nou een stier. Hij heeft wel een leuk permanentje, ja. Zo, goeiedag dames. Dus hier staan ze

allemaal. Hoeveel koeien hebben jullie hier nou eigenlijk staan? Iets meer dan honderd. Iets meer dan honderd? En dat zijn ze allemaal bij elkaar? En alle melkkoeien die melk geven. Die kant op, het is tijd om gemolken te worden. Opstaan! Opstaan! We hebben jullie melk nodig. Nog even poepen. Lekker. Even een borsteltje erover heen. Dat kun jij ook even doen, je haar even kammen.

Kan ik ergens mee helpen? Gewoon de uiers een beetje schoonmaken, gewoon zo. Hoeveel koeien kunnen jullie hier nu tegelijkertijd melken? Aan twee kanten acht, dus zestien. Daar kunnen er acht en dan hierzo acht. En hoeveel liter melk geeft zo'n koe nou per dag? Ja ongeveer 25 liter. Oh, dat is wel aardig wat. Maar je ziet ook hier dat het heel snel volloopt. En ze worden maar een keer per dag gemolken toch? Nee, twee keer: 's morgens en 's avonds. Oke, dus het gaat ongeveer door de helft.

- Boeren gebruiken nu machines voor werk op de boerderij
- Kalfjes drinken niet meer bij hun moeder
- Een koe geeft 's morgens en 's middags melk: zo'n 25 liter per dag

8:51- 11:18

Op de boerderij van Jeffrey werken ze met een melkmachine. Je hebt ook melkrobots, dan hoeft de boer bijna niks meer te doen. Elke koe draagt een halsband, die halsband zendt een signaal uit die voor iedere koe anders is. De computer die de melkrobot bestuurt weet zo van alles over de koe. Hoe laat ze bijvoorbeeld meestal gemolken wil worden en wat de kwaliteit van haar melk is.

De koeien bepalen zelf wanneer ze gemolken willen worden. Als een koe voelt dat haar uier vol zit gaat ze naar de melkrobot. Een lazer zoekt waar de vier uiers zitten, zo weet de melkrobot precies waar hij de bekertjes op de uiers moet plaatsen. Deze tepelbekers doen het zuigen van een kalf na en daardoor komt er melk uit de uiers. De melkrobot onthoudt hoeveel melk er uit elke uier komt. Zo wordt de koe niet te veel of te weinig gemolken.

Educational potential of reviews

De melk gaat via een container naar een enorme koeltank. Om de melk verse te houden wordt het bewaard bij drie graden Celsius. Dat is ongeveer de temperatuur van jullie koelkast. Hoeveel liter melk zit hier ongeveer in? Tussen de 5600 en 7000 liter. Zo, dus dat is ongeveer 5600 pakken melk die hierin zitten. Dat is echt veel. Een paar keer per week wordt de melk opgehaald en naar de fabriek gebracht. De vader van Jeffrey krijgt zo'n 40 cent per liter melk van de fabriek. Proost!

Hmm, maar net stonden al die koeien in de stal maar deze staan hier buiten. Waarom is dat? Deze krijgen nog een kalfje. Die zijn drachtig, zo noem je dat doen. En hoe lang blijven die hier in de wei staan? Uhm, ja in de winter dan gaan ze weer naar binnen. En die koeien die nu in de stal staan, gaan die ook wel eens naar buiten? Ja, in de lente en in de zomer. Oké. Een melkveehouder zoals de vader van Jeffrey heeft heel veel weilanden. Die weilanden worden gebruikt om van het voorjaar tot in het najaar de koeien op te laten grazen.

- Wanneer de koe voelt dat haar uier vol zit, loopt zij zelf naar de melkrobot
- De halsband van de koe stuurt een signaal naar de melkrobot
- Hierdoor weet de melkrobot precies hoe de koe gemolken moet worden
- Melkwagens halen de melk uit een koeltank en brengen de melk naar de fabriek
- In de herfst staan alle koeien op stal, behalve de koeien die nog een kalfje krijgen

11:44 - 16:02

Een deel van het gras dat op de weilanden groeit wordt gemaaid en gebruikt als voer voor de winter. Dat gras wordt in de zon en wind gedroogd en noem je dan hooi. Een ander deel van het gemaaid gras komt op een grote hoop, daar wordt het afgedekt en in elkaar geperst. Het wordt dan kuilvoer, ook voor in de winter. De koeien krijgen trouwens tijdens het melken ook nog krachtvoer dat is gemaakt van granen en daardoor geven ze nu veel meer melk dan vroeger.

Hoe is het nou om op zo'n boerderij te wonen? Ja ik vind het heel erg leuk. Je kunt van alles doen en je hebt vooral ruimte en veel ruimte om te skelteren. Je bent gewoon bezig met de dieren en dat vind ik gewoon leuk om met de koeien en de kalfjes zo en de katten en geiten van alles. Maar kan je bijvoorbeeld wel altijd op vakantie? Want je hebt hier natuurlijk een hele hoop dieren. Ja

Educational potential of reviews

soms wel als je dan iemand inhuurt die dan komt melken voor ons. Oh dat vind ik eigenlijk ook wel leuk om te doen als jullie op vakantie gaan. Ja. Of denk je dat ik dat niet kan? Oh, dat kan je wel. Moet ik nog even wat lesjes van jou krijgen? Neuj. En wil je later ook zelf boer worden?

Misschien wel en ligt er ook aan als ik het bedrijf nog over kan nemen. Dat zou wel leuk zijn hè. Zo dit bevalt me wel. Hallo jongens! Zo, jongens! Waar moet het liggen? Binnen, in de stal. Oh, ja. Allemaal meisjes. Zo, dit is niet een klein hutje man. Nee. Heb je die helemaal in je eentje gebouwd? Ja, misschien. Ik denk dat ik hier gewoon zo blijf liggen. Tegenwoordig hebben de meeste boeren in Nederland grote bedrijven met een soort product. Ze houden bijvoorbeeld net als Jeffreys vader alleen koeien of ze verbouwen alleen suikerbieten.

Maar vroeger was dat anders, toen waren er de meeste boerenbedrijven kleine gemengde bedrijven. Boeren hadden dan bijvoorbeeld 15 koeien, een paar varkens en kippen. En op het land verbouwden ze verschillende gewassen zoals aardappelen en suikerbieten. Ze deden dus aan landbouw en aan veeteelt. De opbrengst van het land werd niet alleen verkocht op de markt maar was ook voedsel voor de boerenfamilie en de dieren. Het werk op de boerderij was zwaar er waren nog niet zoveel machines als nu. Veel werk werd met de hand gedaan: het melken bijvoorbeeld. De boeren hadden het niet makkelijk.

Boeren hebben tegenwoordig ook problemen. Ze krijgen steeds minder geld voor hun producten en de kosten die ze moeten maken zijn heel hoog. Veel boeren stoppen er daarom mee. Of ze beginnen naast hun boerenbedrijf nog iets anders op de boerderij. Zoals hier een manage, of een boerderijcamping of ze verkopen boerenijs. Lekker hoor en een goed idee ook. Wat zou het toch jammer zijn als we in de toekomst steeds minder koeien op het land zouden zien.

- Er zijn twee soorten gemaaid gras:
- Kuilvoer is gras dat op een hoop wordt gegooid en wordt afgedekt en in elkaar geperst
- Hooi is gras dat op het land door de zon en wind wordt gedroogd

- Vroeger hadden veel boeren een klein bedrijf met meerdere producten en weinig machines

- Nu hebben de meeste boeren een groot bedrijf met 1 product, bijvoorbeeld koeien of suikerbieten

Appendix D

Introduction page of booklet 1

Akkers en weilanden

INSTRUCTIEBOEKJE 1

NAAM:

JONGEN/MEISJE:

LEEFTIJD:

GROEP 5/ GROEP 6:

In dit boekje staan de vragen die horen bij het onderzoek over video's. Je schrijft de antwoorden op in dit boekje.

Je zult twee verschillende plaatjes tegenkomen:



Dit icoon betekent dat je de **video** gaat bekijken



Dit icoon betekent dat je **vragen** in dit boekje gaat maken


WACHT totdat Yvonne zegt dat je verder mag gaan

Appendix E.

Instructions about entering the video environment

Inloggen op de website

Nu heb je je laptop nodig. Zet deze voor je neer zodat je het scherm goed ziet. Je doet de stappen die hieronder staan op je laptop.

<p>1. Type in het vakje 'Nickname':</p> <p>Click op login. Er verschijnt een nieuw scherm.</p>	
<p>2. Lees wat er boven de video staat en doe wat er gezegd wordt.</p>	

WACHT todat Yvonne tegen je zegt dat je verder mag gaan

Appendix F

Example of design of questionnaire

Vragenlijst 1



Geef op de kaart aan in hoeverre je het eens bent met de vragen

Hoe goed kun je....?



	1	2	3	4	5	6	7
Voorbeeld: Je kamer opruimen?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
1. opdrachten maken voor aardrijkskunde/ natuur en techniek?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
2. uitleggen wat een veeboer doet?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
4. uitleggen wat een akkerbouwboer doet?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
5. uitleggen hoe boeren vroeger werkten?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
6. uitleggen waarvoor een boer machines gebruikt?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
7. uitleggen waar een melkrobot voor wordt gebruikt?	Heel goed						Heel slecht
	1	2	3	4	5	6	7
8. uitleggen hoe een boer aan veevoer komt?	Heel goed						Heel slecht
	1	2	3	4	5	6	7

WACHT totdat Yvonne zegt dat je verder mag gaan

Appendix G

Concept map of the instructional video



Appendix H:

Post-test questions codebook

The green coloured text refers to questions who can be extracted from the review.

Total points: 13

Vraag (groen is herleidbaar uit review)	Antwoord	Punten
1. Waarom zijn boerenbedrijven nodig? (understand)	<ul style="list-style-type: none"> Voor de voedselvoorziening Voor eten en drinken, zoals vlees en melk en wol, groenten 	1
	<ul style="list-style-type: none"> Melk en kaas Ze maken heel veel dingen die wij nodig hebben 	0,5
2. Noem drie gewassen uit de akkerbouw. (remember)	<ul style="list-style-type: none"> Aardappelen Granen Suikerbieten Bloemkool Wortels Aardbei Boerenkool 	2
	<ul style="list-style-type: none"> 2 gewassen genoemd Suikerbieten, groente en fruit 	1
	<ul style="list-style-type: none"> 1 gewas genoemd 	0
3. Hoe krijgt een kalfje moedermelk? (understand)	<ul style="list-style-type: none"> De melk van de moeder wordt in een emmer gegoten met nep-uiers. Je geeft het een bak daarna kan het kalfje drinken door een soort uier Door een gekke ton en daar aan zit een klein buisje en daar zuigt die aan en dan komt er moedermelk uit Uit een bakje daar doen ze moedermelk 	2

	<p>in en via een slangetje die lijkt op een tepel kan hij aan zuigen en dan drinken</p>	
	<ul style="list-style-type: none"> • Uit zo'n hoe zeg je dat uit een fles ofzo en het lijkt echt op de buidel van een koe • De moeder wordt gemolken door een melkrobot en de melkrobot brengt de melk naar het kalfje • De moedermelk wordt met een machine uit haar uier gehaald. De boer haalt het uit de koelcel en geeft het aan het kalfje. 	1
	<ul style="list-style-type: none"> • Door uit de uier te drinken van haar moeder • Om te zuigen 	0,5
<p>4. Hoe vaak wordt een koe gemolken per dag (remember)</p>	<ul style="list-style-type: none"> • Twee keer • Dat bepaald die zelf dan voelt hij dat zijn uier vol zit gaat hij naar een machine en dan gaat het via slangetjes weg 	1
<p>5. Waarom dragen koeien een halsband (understand)</p>	<ul style="list-style-type: none"> • De halsband zendt een signaal uit naar de computer van de melkrobot waardoor deze alles weet over de koe. • Dan weet de melkrobot wanneer en hoeveel hij moet melken • Om de melkrobot, om te weten wat voor melk ze heeft 	2

Educational potential of reviews

	<ul style="list-style-type: none"> • Want dan komt de melkrobot meer te weten over de koe • Zodat de robot weet hoe lang en hoe kort hij moet knijpen 	
	<ul style="list-style-type: none"> • Dan weet het apparaat alles van de koe. • Zo worden ze herkent • Dan weet het apparaat of de koe het wel fijn vindt en zo • Dan weet de machine wat voor soort koe het is • Om de melkrobot, om de uier leeg te halen • Omdat de robot je kan scannen 	1
	<ul style="list-style-type: none"> • Ik weet niet of het goed is maar dit denk ik als een koe bijvoorbeeld verloren is dan kan je hem terug vinden <u>of als hij gemolken moet worden</u> • <u>Omdat iedere koe anders is</u> heeft ieder zijn eigen nummer • Denk dat ze zien wat voor melk hij geeft • Omdat ze dan weten wie wie is • Signaal 	0,5
6. Hoe noem je het wanneer een koe een kalfje krijgt? (remember)	<ul style="list-style-type: none"> • Dan is de koe drachtig 	1

Educational potential of reviews

	<ul style="list-style-type: none"> • Zwanger • Bevalling 	0,5
	<ul style="list-style-type: none"> • 	
7. Hoe wordt kuilvoer gemaakt? (apply)	<ul style="list-style-type: none"> • Het gras wordt op een grote hoop gelegd en in elkaar geperst • Heel veel <u>gras</u> maaien en <u>onder een zeil</u> leggen 	2
	<ul style="list-style-type: none"> • Van hooi die bij elkaar wordt <u>geperst</u> • <u>Geperst</u> gras • Van een grote stapel wat dan <u>ingedrukt</u> wordt • Van <u>gras</u> • Door bergen <u>gras</u> dat gemaaid is 	1
8. Hoe komt het dat koeien nu meer melk geven dan vroeger? (understand)	<ul style="list-style-type: none"> • Ze krijgen krachtvoer dat is gemaakt van graan. 	2
	<ul style="list-style-type: none"> • Door een bepaald voer dat de boeren geven • Omdat ze speciale eten krijgen • Krachtvoer 	1,5

Appendix I:

Delayed-post test questions codebook

The green coloured text refers to questions who can be extracted from the review.

Total points: 14

Vraag (groen is herleidbaar uit review)	Antwoord	Punten
1. Wat doet de landbouw? (understand)	<ul style="list-style-type: none"> Landbouw is het gebruik van land voor de productie van planten en dieren voor menselijk gebruik (dus voedselvoorziening) Ze verbouwen eten op het land 	2
	<ul style="list-style-type: none"> Verbouwt groenten Dingen voor in de winkel maken Producten verbouwen Eten verbouwen Een land voor koeien, varkens en kippen (?) Suikerbieten en aardappelen uit de grond halen Voor koeien zorgen en eten maken Dingen planten Eten planten en verkopen melken 	1
	<ul style="list-style-type: none"> Groenten, planten 	0,5
2. Noem drie producten die van dieren komen van veeteeltbedrijven (remember)	<ul style="list-style-type: none"> Melk Kaas Boter Vlees 	2
	<ul style="list-style-type: none"> 2 goed Koe, varken, kip 	1
	<ul style="list-style-type: none"> 1 goed 	0

Educational potential of reviews

<p>3. Waarom wordt er steeds meer met machines gedaan in de landbouw? (understand)</p>	<ul style="list-style-type: none"> • Dat is minder arbeidsintensief dus minder zwaar. <i>Hiermee wordt bedoeld dat machines het werk beter en sneller kunnen dan de boer zelf.</i> • Dan is het minder werk /anders is het veel werk • Zodat het sneller gaat • Omdat je dan meer tijd bespaard • Zodat boeren het niet superdruk krijgen 	<p>2</p>
	<ul style="list-style-type: none"> • Dan hoeft je niet alles met de hand te doen • Het gaat makkelijk 	<p>1</p>
<p>4. Hoe vaak wordt een koe op een dag gemolken? (remember)</p>	<ul style="list-style-type: none"> • Twee keer • Bepaalt hij zelf 	<p>1</p>
<p>5. Wanneer gaat een koe naar de melkrobot toe? (understand)</p>	<ul style="list-style-type: none"> • Als ze voelt dat haar uier vol zit. • Als ze voelt dat ze gemolken moet worden • Als zij denkt ik wil gemolken worden 	<p>1</p>
	<ul style="list-style-type: none"> • Wanneer hij wil • Om gemelkt te worden • 's Morgens / 's avonds • Als hun buik vol zit /Als hij zich vol voelt (?) 	<p>0,5</p>

Educational potential of reviews

<p>6. Hoe zorgt een melkrobot ervoor dat een koe niet teveel of te weinig wordt gemolken? (apply)</p>	<ul style="list-style-type: none"> • De melkrobot onthoudt elke keer hoeveel melk eruit de uier komt. • Er is een apparaat om de koe zijn nek en daarmee kan de melkrobot weten hoeveel de koe gemolken moet worden 	<p>2</p>
	<ul style="list-style-type: none"> • Door de koe te scannen • Door een bandje om zijn nek • Door het nummerkaartje weet ie hoeveel het moet • Omdat hij het opmeet • Omdat de robot een sensor heeft 	<p>1</p>
	<ul style="list-style-type: none"> • Het gaat in een soort maatbeker en dan ziet de melkrobot hoeveel hij of zij gemolken heeft • Omdat de melkrobot aan de uier zuigt en als er niks meer uitkomt is het klaar • Door iets op de koe te doen 	<p>0,5</p>
<p>7. Hoe wordt hooi gemaakt? (apply)</p>	<ul style="list-style-type: none"> • Het gras wordt in de zon en wind gedroogd. • Van gras dat opdroogt • Hooi is gedroogd gras 	<p>2</p>

Educational potential of reviews

	<ul style="list-style-type: none"> • Met een machine wordt gras opgerold en in een ruimte stopt waar het hooi kan worden (dat het gedroogd is) 	
	<ul style="list-style-type: none"> • Gras laten drogen onder een zijl • Door oud gras 	1
	<ul style="list-style-type: none"> • Alleen gras 	0,5
8. Waarom geven koeien nu meer melk dan vroeger? (understand)	Ze krijgen krachtvoer dat is gemaakt van graan.	2
	<ul style="list-style-type: none"> • Omdat ze speciaal voer krijgen waar door ze meer melk geven • Omdat ze krachtvoer krijgen 	1,5

Appendix J:

Self-Efficacy Questionnaire

Hoe goed kun je....?

Voorbeeld: je kamer opruimen?	Heel goed 1 2 3 4 5	Heel slecht 6 7
1. opdrachten maken voor aardrijkskunde/ natuur en techniek?	Heel goed 1 2 3 4 5	Heel slecht 6 7
2. uitleggen wat een veeboer doet?	Heel goed 1 2 3 4 5	Heel slecht 6 7
3. uitleggen wat een akkerbouwboer doet?	Heel goed 1 2 3 4 5	Heel slecht 6 7
4. uitleggen hoe boeren vroeger werkten?	Heel goed 1 2 3 4 5	Heel slecht 6 7
5. uitleggen waarvoor een boer machines gebruikt?	Heel goed 1 2 3 4 5	Heel slecht 6 7
6. uitleggen waar een melkrobot voor wordt gebruikt?	Heel goed 1 2 3 4 5	Heel slecht 6 7
7. uitleggen hoe een boer aan veevoer komt?	Heel goed 1 2 3 4 5	Heel slecht 6 7

Appendix K:

Self-regulation questionnaire

Hoe goed kun je...?

1. Bedenken in welke volgorde je taken maakt?	Heel goed 1 2 3 4 5 6 7	Heel slecht
2. Uitleggen hoe je iets heb opgelost?	Heel goed 1 2 3 4 5 6 7	Heel slecht
3. Herinneren van uitleg?	Heel goed 1 2 3 4 5 6 7	Heel slecht
4. Opletten tijdens de les	Heel goed 1 2 3 4 5 6 7	Heel slecht
5. Oplossen van problemen?	Heel goed 1 2 3 4 5 6 7	Heel slecht
6. Nakijken van je werk?	Heel goed 1 2 3 4 5 6 7	Heel slecht
7. Opmerken dat iets goed of fout is gegaan?	Heel goed 1 2 3 4 5 6 7	Heel slecht

Appendix L:

Interview questions and Likert Scale



Introductievraag: De vorige keer dat ik er was heb je een video gezien over de landbouw. Die video vertelde bijvoorbeeld dingen over suikerbieten en over het melken van koeien. Weet je dat nog? Ik wil je daar graag een paar vragen over stellen.

1. Kun je op de kaart aangeven hoe leuk je de video vond?

Probes:

- a. Waarom geef je dit cijfer?
- b. Wat vond je leuk aan de video?
- c. Wat vond je minder leuk aan de video?
- d. Wat zou je veranderen zodat de video leuker is?

2. Kun je op de kaart aangeven hoe leerzaam je de video vond?

Probes:

- a) Waarom geef je dit cijfer?
- b) Heb je speciale dingen gedaan om informatie uit de video te onthouden?
- c) Wat zou je veranderen zodat je meer van de video kan leren?

Appendix M

Instructions given about the experiment

In the first booklet you make an assignment before watching the video and in booklet 2 you make an assignment when you have watched the video so you can only open it then. I will show you what the booklet looks like (*showing booklet*). When it says "WAIT," you should really wait for me until I tell you to continue. The questions in the booklet are not intended as a real test. You enter what you know so it's okay if you don't know the answer.

Once we have started you cannot consult each other. You have a few minutes per assignment in the booklet. I will tell you in advance how long you have. If you have to wait a while, read your reading book. When you have arrived at the video, you have to wait because we will start jointly. Please watch the video with earplugs so that others are not bothered by the sound.

Do you have questions for me? Is something not clear? Then you can still ask me now because when we start, I am not allowed to answer any more questions, unless you cannot log in the computer environment.

Appendix N

Transcribed interviews

Introductie

Y: De vorige keer dat ik er was heb je een video gezien over de landbouw en die video vertelde bijvoorbeeld dingen over suikerbieten en over het melken van koeien. Weet je dat nog?

Y: En daar wil ik dus graag een paar vragen over stellen over die video. Verder zijn er geen foute antwoorden en je mag ook stoppen wanneer je wilt. Als mijn opdracht af is zal ik deze opnames verwijderen. Dus dan wordt het alleen maar voor mijn opdracht gebruikt.

Y: Ja dat is het eigenlijk. Heb jezelf verder nog vragen?

L24

Y: Uhm, ik heb deze kaart meegenomen. Kun je op de kaart aangeven hoe leuk je de video vond?

K: Uhm, ik vond het, ja. Beetje tussen deze in. Op zich 2.

Y: 2, oke. Waarom geef je dat cijfer?

K: Nou, uhm, ja ik vond het wel heel erg leuk van dat filmpje en ja ook wel heel lang. Ja maar niet heel erg, maar ja ik vond het eigenlijk wel normaal, gewoon goed eigenlijk. Gewoon niet al, niet heel blij maar wel gewoon normaal eigenlijk.

Y: Ja. Dus eigenlijk tussen heel leuk en minder leuk in.

K: Ja.

Y: Oke. En wat vond je wat minder leuk aan de video?

K: Uhm, ja ook eigenlijk weer dat uhm, ja, uhm dat eigenlijk, ja eh. Iets minder leuk vond ik wel, ja eh.

Y: Ja het is wel even lastig om helemaal terug te denken naar een paar weken geleden.

K: Ja, dat van. Het duurde ook best lang dat filmpje.

Y: Ja.

K: Maarja, opzich was het wel goed enzo, maar ja.

Y: Je zou liever iets korter willen.

Educational potential of reviews

K: Ja. Dat wel.

Y: Ja.

K: Maar op zich was het best wel leuk dat filmpje.

Y: Hmm, hmm, maar hij zou dus wel leuker zijn als hij wat korter zou zijn.

K: Ja denk het wel.

Y: Oke. En wat vond je het leukst aan de video?

K: Uhm, dat er ook vroeger in kwam en wat ze toen deden en het was heel erg leerzaam enzo.

Y: Hmm, hmm.

K: Van je kon ook weten wat boeren allemaal doen en ja welke dieren ze allemaal kunnen hebben en alles.

Y: Ja.

K: En ook wat voor groente of fruit of zoals vroeger hoe ze dat deden. En ja, dat vond ik best wel bijzonder eigenlijk en vooral van vroeger.

Y: Ja, en ja dan komen we eigenlijk al op de volgende vraag: kun je aangeven hoe leerzaam je de video vond?

K: Ja, die.

Y: Een 1.

K: Ja.

Y: Dus wel echt heel leerzaam.

K: Ja.

Y: En waarom vond je het zo leerzaam?

K: Nou omdat ik nog niet alle dingetjes wist enzo. Ook hoe ze het vroeger deden. Dat wist ik niet helemaal en ik wist ook al helemaal niet dat koeien ook zelf naar de machines kunnen gaan.

Y: A ja.

K: En ja dat wist ik eigenlijk helemaal niet. Ik dacht eigenlijk gewoon dat boeren het zelf deden. Maar ik wist opzich wel van de machines enzo. Dat wist ik wel maar ik wist niet dat koeien zelf erheen konden gaan. En ook van hoe groter een ruimte opzich, hoe, ja, ik weet niet echt wat het meer was. Hoe minder geld je dan kreeg volgens mij.

Y: Hmm, hmm.

Y: Okee, heb je ook speciale dingen gedaan om meer te onthouden uit de video?

K: Ja, sommige stukjes heb ik wel nog een keer teruggekeken eigenlijk.

Y: Okee.

K: Want dat lange stukje dat spoelde ik weer terug en dan kon ik het weer zien.

Y: Hmm, ja dat is inderdaad wel een goede manier.

Y: En wat zou je veranderen aan de video zodat je nog meer van de video zou kunnen leren?

K: Uhm, ja. Wat ik nog meer zou leren is denk ik ja, het hele filmpje eigenlijk nog een keer kijken en dan ja en dan eigenlijk van ik kan het bijvoorbeeld ook opschrijven.

Y: Hmm, hmm.

K: Van wat die zegt en dan kan je het weer herhalen.

Y: Ja.

K: Want van lezen kan je het ook heel erg onthouden.

Y: Hmm, ja. Nee dat is zeker waar ja. Ja dat zou ook wel een goede manier zijn ook. Nou, ik denk dat ik zo wel veel te weten ben gekomen, dus dit eigenlijk alweer het einde van het gesprekje.

K: Oke.

Y: Wil je zelf nog iets zeggen over de video?

K: Uh, nee eigenlijk niet.

Y: Oke, nou dan wil ik je heel erg bedanken. Dat kan ik zeker meenemen.

K: Alsjeblieft.

L13

Y: Kun je op de kaart aangeven hoe leuk je de video vond?

K: Nouja, opzich wel, de 3.

Y: Hmm, hmm.

K: Want je kon ervan leren en leren is wel goed. Dus, maar het was ook weer niet te, heel, heel erg leuk. Dus daarom heb ik voor die.

Y: Dus 3, oke.

K: Ja.

Y: En wat vond je leuk aan de video?

K: Uhm, nou ik vond het een beetje grappig hoe ze de melkrobot aanzetten. Want dat is best wel een raar systeem.

Y: Hmm, hmm.

K: En, ik vond het grappig dat uhm, dat dat meisje bij die bak bij die jongen ging zitten. En, dat vond ik gewoon leuk.

Y: Ja, dus er zaten vooral wat grappige dingen in de video die het eigenlijk leuk maakten.

K: Ja.

Y: Ja. En wat vond je minder leuk aan de video?

K: Nou, ehm, soms zat je je een beetje te vervelen omdat je, uhm, nou, eh, een beetje, ehm, ja, je werd. Ja, ik kan dat eigenlijk niet, echt iets over zeggen. Het was eigenlijk wel goed en daarom kan ik er eigenlijk niks over zeggen.

Y: Hmm, hmm, maar het was dus wel zo dat je je soms een beetje verveelde tijdens de video eigenlijk.

K: Ja. Had ik een beetje geen zin in allemaal.

Y: Wat zou je veranderen zodat de video leuker wordt?

(Stilte)

Y: Zodat je iets meer naar de 1 of de 2 toegaat.

K: Nou, ehm, nou het zou, ehm, leuker worden als het iets meer inspiratie. Want ik er niet echt inspiratie aan over het boekje.

Y: Hmm, hmm.

K: En als er meer informatie in zat had ik het wel iets leuker gevonden.

Y: Oke, dus dat er iets meer informatie in de video zou zitten?

K: Ja.

Y: Oke. Nou dat zou een goed verbeterpunt zijn natuurlijk. Nou dan gaan we door naar de volgende vraag. En kun je ook aangeven op de kaart hoe leerzaam je de video vond? Dat heeft er al wel een beetje mee te maken met wat je zei.

K: 2.

Y: 2.

K: Ik vond het wel leerzaam, want ik wist bijna niks over de landbouw. Door die video kon ik het al meer, beter. Dat vond ik eigenlijk wel fijn.

Y: Ja, je hebt dus vooral nieuwe dingen geleerd.

K: Ja.

Y: Ja, ja, oke. En heb je zelf ook speciale dingen gedaan waardoor je meer informatie kon onthouden?

K: Ja, als er maar heel weinig plaatjes was heb ik zelf een plaatje in mn hoofd gemaakt en daardoor snapte ik het meer. Dat was wel handig voor mezelf.

Y: Dat is zeker wel een goede manier om te doen. En wat zou je veranderen zodat je nog meer kunt leren van de video?

K: Nouja, ehm. Nouja, ehm. Je zag hem niet maar. Je zag alleen maar een beetje wat ze verbouwd en de koeien. En als ze het over meer dieren hadden dan vond ik het ook wel leuker.

Y: Hmm, hmm. Dus iets meer over de veeteelt eigenlijk.

K: Ja.

Y: Oke, dat kan. Uhm nou eigenlijk weet ik nu wel genoeg. Wil je zelf ook nog iets zeggen over de video.

K: Nou, de video was opzich wel leuk maar ook wel minder. Het was wel gewoon oke om te doen.

Y: Hmm, hmm.

K: Dat was het.

Y: Nou, heel erg bedankt, dan loop ik even mee.

L21

Y: Nou ik heb deze kaart meegenomen. En kun je op deze kaart aangeven hoe leuk je de video vond?
Een 3?

K: Ja.

Y: En waarom geef je dat cijfer?

K: Uhm, ik vond wel dat het, uhm, uh, heel veel gepraat werd. En op het begin, uhm, ging ze niet praten over alles.

Y: Hmm, hmm.

K: Over wat er gebeurt en daarom vind ik het een 3.

Y: Oke, en wat zou je aan de video veranderen zodat je iets meer naar de 2 of de 1 toegaat?

K: Uhm, dat ze al in het begin, uhm, gelijk gaan praten en niet eerst dingen laten zien en dan pas gaan praten.

Y: Hmm, hmm, dus dat je eigenlijk eerst wat meer uitleg krijgt.

K: Ja.

Educational potential of reviews

Y: Dat, oke. En wat vond je leuk aan de video?

K: Uhm, dat ik meer ging weten over landbouw, want daar wist ik nog niet zoveel van maar daarom doe ik ook een 3 want ik heb ook heel veel geleerd.

Y: Hmm, hmm.

K: Want ik wist nog niet dat er melkmachines waren en andere dingen.

Y: Ja.

K: Dus het was wel goed.

Y: Oke, en wat vond je nou minder leuk aan de video?

K: Op het begin

Y: Dus eigenlijk wat je net al vertelde.

*K: *knikken**

Y: Ja, oke. Nou dan gaan we verder naar de volgende vraag. Dat is. Uhm, kun je op de kaart aangeven hoe leerzaam je de video vindt?

Y: een 1?

K: Ja.

Y: Dus heel leerzaam.

K: Ja.

Y: En waarom vind je het superleerzaam?

K: Uhm, als je niks weet erover dan heb je een hele goede uitleg.

Y: Hmm, hmm.

K: Als eerst, uhm, is er dan informatie en dan wordt er dingen uitgelegd hoe alles moet.

Y: Ja.

K: Dus daarom vind ik het leerzaam.

Y: Ja, oke. En heb je bijvoorbeeld zelf ook speciale dingen gedaan om meer te onthouden uit de video?

K: Nee.

Y: Je hebt gewoon de video gekeken en op basis daarvan heb je gewoon dingen onthouden.

K: Ja.

Y: Oke. Wat zou je veranderen zodat je eigenlijk meer kunt leren van de video?

Educational potential of reviews

K: Op het begin gelijk gaan praten.

Y: Hmm, hmm. Dus gelijk meer uitleg geven?

K: Ja.

Y: Oke, nou dat geeft mij in ieder geval al, een heel goed beeld eigenlijk. Wil je zelf nog iets zeggen over de video?

K: Uhm, ik vond het wel een leuke en een goede video want uhm, want uhm, ik vond het heel leerzaam.

Y: Hmm, hmm.

K: Ja daarom vond ik het leuk.

Y: Ja. Dat is meestal zo als je er veel van leert is het meestal ook een stuk leuker inderdaad.

K: Ja.

Y: Ja. Dat was het eigenlijk al, heel erg bedankt! Ik kan hier zeker wat mee.

K: Alsjeblieft.

L2

Y: Kun je op de kaart aangeven hoe leuk je de video vond?

K: 3.

Y: Een 3, oke. En kun je ook uitleggen waarom je dat cijfer geeft?

K: Uhm, nee eigenlijk, ik kan het niet echt uitleggen.

Y: Oke, maakt niet uit. Wat vond je leuk aan de video bijvoorbeeld?

K: Dat ze lieten zien hoe het allemaal werkte.

Y: Hmm, hmm.

K: En ik vond het wel leuk dat de koeien zegmaar zelf ergens heen lopen, dat ze dat weten. En dat ze daar dan worden gemolken.

Y: Hmm, hmm.

K: En dat was het.

Y: Ja, dus dat waren eigenlijk wel nieuwe dingen eigenlijk die je dan had geleerd.

K: Ja.

Y: En ja wat vond je minder leuk aan de video?

K: Uhm, eigenlijk niks.

Y: Dus je vond eigenlijk alles wel leuk?

K: Ja.

Y: Ja, en wat zou je veranderen zodat de video misschien leuker kan worden, zodat je misschien iets meer naar de hele lachende smiley toegaat?

K: Uhmm, weet ik eigenlijk niet. Nee.

Y: Nee?

K: Ik vind het eigenlijk prima zo.

Y: Oke. Dus er zijn niet echt dingen waarvan je zegt die zou ik toch net iets anders willen in een volgende video?

Niet echt? Nou, dat kan.

Y: Uhm, kun je op de kaart ook aangeven hoe leerzaam je de video vond?

K: Uhm, 2.

Y: Een 2.

K: Ja.

Y: Oke. En hoe zo geef je een 2?

K: Uhm, nou wacht, is 2 dan, is dat dan het laagst, ligt dat dan het laagst of ligt dat het hoogst?

Y: Nou, een 2 is dat je er wel gewoon blij van wordt, dus dat het heel leerzaam is en als je naar deze kan toegaat, een 7 dat is dus een beetje heel verdrietig dan vond je het helemaal niet leerzaam.

K: Ja, ik vond het wel heel leerzaam.

Y: En waarom geef je zegmaar het cijfer dat je het heel leerzaam vindt?

K: Uhm, omdat ik vind dat het goed wordt uitgelegd.

Y: Hmm, hmm.

K: Duidelijk uitgelegd dus, en uhm, ik vond het ook best wel makkelijk te onthouden.

Y: Oke. En deed je dan zelf ook speciale dingen om meer te onthouden uit de video?

K: Uhm, nee niet echt.

Y: Want waar lag dat bijvoorbeeld aan dat je het makkelijk vond om te onthouden?

K: Omdat uhm, omdat het was, nah, ik vond het gewoon makkelijk. Want ik onthoud ook best wel veel dingen.

Y: Hmm, hmm.

K: En dus vind ik het ook wel fijn dat het zo wordt uitgelegd.

Y: Nou dat kan zeker helpen inderdaad.

Y: Wat zou je veranderen aan de video zodat je er meer van kunt leren, zodat je nog meer naar deze kant toegaat?

K: Uhm, dat er bijvoorbeeld, een klein beetje uitgelegd hoe het zeg maar werkt met uhm dat de koe gemolken wordt met een machine.

Y: Hmm, hmm.

K: Dus dat iets een beetje uitgelegd zou worden, zou ik het nog beter weten.

Y: Ja.

K: En uhm, ja dat is het eigenlijk wel.

Y: Dus vooral dat je iets meer informatie daarover krijgt.

K: Ja.

Y: Ja, oke. Nou, dan was dit eigenlijk al het einde van het gesprekje. Wil je zelf nog iets zeggen over de video?

K: Nee.

Y: Verder niet? Oke, nou dat is al wel heel veel informatie tegelijk. Heel erg bedankt.

L30

Y: Uhm, kun je aangeven hoe leuk je de video vond?

L: Middelmattigachtig.

Y: En welk cijfer zou je dan geven?

L: Een 5.

Y: Een 5, oke. En hoezo geef je dat cijfer?

L: Nou, het is een beetje ouderwets.

Educational potential of reviews

Y: Ja, dus het was eigenlijk een wat ouder filmpje eigenlijk inderdaad. Je zou liever een nieuwer filmpje zien? Nou dat snap ik wel.

Y: Wat vond je bijvoorbeeld wel leuk aan de video? Wat waren leuke dingen die er in zaten?

L: Nou, niet echt iets.

Y: Dus je zou eigenlijk een 7 geven?

L: Ja.

Y: Ja, en wat zou ik eraan kunnen doen om nu meer naar deze kant toe gaan zodat het filmpje leuker wordt? Je zei net al het filmpje is een beetje ouderwets maar zijn er dingen meer dingen die leuker gemaakt kunnen worden?

L: Weet niet.

Y: Dus eigenlijk als het nieuwe filmpje zou zijn, dan zou je al helemaal hier zitten?

L: Misschien.

Y: Misschien.

L: En wat betere beelden.

Y: Ja.

L: Het was een beetje blokjesachtig.

Y: Ja, zaten vooral wat blokjes in en het was niet helemaal scherp. Nou dat is natuurlijk iets wat heel goed veranderd kan worden. Dat zou het voor jou dus eigenlijk leuker maken dan?

L: Ja wel een beetje.

Educational potential of reviews

Y: Oké, nou dat zijn natuurlijk dingen die heel goed veranderd kunnen worden. Nou, dat was eigenlijk al over hoe leuk je de video vind en heb ik ook nog een vraag over hoe leerzaam je de video vindt. Dus ook van 1 t/m 7.

L: een 7.

Y: Dus helemaal niet leerzaam?

L: Nee. Ja. Want ik wist het al.

Y: Dus je wist eigenlijk alles al wat er werd verteld.

Nou dan kan ik me voorstellen dan haal je er niet zoveel nieuwe dingen meer uit eigenlijk.

Da's waar.

Uhm, heb je zelf ook tijdens het kijken van het filmpje speciale dingen gedaan zodat je misschien bepaalde dingen beter kon onthouden?

L: Niet heel erg.

Y: Oké. En wat zou je veranderen zodat je meer kunt leren van het filmpje? Zodat je ja, nu waren er eigenlijk heel veel dingen die je al wist, hoe zou je het leerzamer kunnen maken zodat je er ook zelf echt iets van leert?

L: Ja een paar sommen enzo.

Y: Hmm, hmm. Wat voor sommen zouden er in moeten doen?

L: Gedeeld door, keer.

Y: En bijvoorbeeld als je dan aan de landbouw denkt, want het filmpje ging natuurlijk over de landbouw. Wat zou je er dan aan veranderen?

L: Niet echt ouderwets maar wat nieuwer.

Y: Dus vooral een nieuwer filmpje eigenlijk.

L: Ja.

Educational potential of reviews

Y: Wil je zelf ook nog iets zeggen over het filmpje? Een tip voor mij, zodat ie beter, leuker, leerzamer kan worden?

L: *Nou , nee.*

Y: Dat was het eigenlijk? Oke, in ieder geval heel erg bedankt dat ga ik meenemen voor mijn opdracht. Dat is zeker erg handig.

L34

Y: Kun je op de kaart aangeven hoe leuk je de video vond?

L: *Hmm.*

Y : Er zijn geen goede of foute antwoorden..

L: 3.

Y: Een 3. En hoezo geef je een 3?

L: *Uh, ik vond uh, dat eh, de stem niet goed, eh dat ze niet hard genoeg praatte, dat.*

Y: Oké, en welke stem bedoel je ? want er waren meerdere stemmen in het filmpje.

L: *Van die vrouw op de fiets zat.*

Y: Die op de fiets zat, oja. Ja. Dus die zou eigenlijk iets harder moeten praten. Oké.

Wat vond je al wel leuk aan de video? Wat zou zo moeten blijven?

L: *Uhm, dat ze bij de boerderij, dat ze, uhm, dat melken enzo gingen doen, uhm.*

Y: Dat je echt een beetje meekomt in de boerderij eigenlijk.

L: *Ja.*

Y: Dat is inderdaad wel grappig dat je dat echt even helemaal ziet hoe dat gaat.

Educational potential of reviews

Zijn er nog andere dingen die je minder leuk vond aan de video?

L: Nee.

Y: Oké, verder niet.

En wat zou je mij als tip geven om de video leuker te maken? Dus dat je meer naar de 2 of de 1 toe zou gaan?

L: Beter wordt opgenomen.

Y: Beter wordt opgenomen, dus beter geluid, ja oké. En dat gaat dan over het hele filmpje of over de vrouw op de fiets?

L: Over de vrouw op de fiets.

Y: Oké. Kun je ook aangeven op de kaart hoe leerzaam je de video vond?

L: Hm.

Y: Weet je wat ik daar mee bedoel met leerzaam?

Het is vooral wat je hebt geleerd van de video.

L: Best wel veel.

Y: Best wel veel en hoe veel als je dat hier een cijfer voor zou moeten geven?

L: Een 2.

Y: Een 2, oké en hoezo geef je dat cijfer?

L: Uh, omdat ik best goed vond gaan wat ze allemaal deden en ja.

Y: En wat bedoel je met wat ze allemaal deden?

L: Met uh, het op de boerderij en ja, dat.

Educational potential of reviews

Y: Vooral omdat je dat meekreeg, van hoe gaat dat eigenlijk. En heb je zelf ook speciale dingen gedaan zodat beter dingen kon herinneren onthouden uit de video?

L: Nee.

Y: Nee?

Oké, uhm als je bijvoorbeeld de vragen aan het maken was, heb je toen ook speciale dingen gedaan om weer terug te denken?

L: Nee.

Y: Verder ook niet echt, oké. En wat zou je zelf veranderen zodat je meer kan leren van het filmpje? Zodat je in plaats van de 2 helemaal naar de 1 toegaat?

L: Uhm, weet ik eigenlijk niet.

Y: Zijn er misschien speciale dingen terwijl ik de vragen maak dat ik daar even aan kan terugdenken zodat je beter de vragen kunt beantwoorden?

Niet echt, oké dat kan. Zijn er zelf nog dingen die je over het filmpje kan zeggen zodat het beter kan worden, tips voor mij?

L: Nee.

Y: Verder niet. Dit was het eigenlijk?

Oké, nou dan is dit eigenlijk alweer het einde van het gesprekje. In ieder geval heel erg bedankt.

L46

Y: De eerste vraag is: kun je aangeven hoe leuk je de video vond? Dus van hier tot hier, dan mag je wel je vinger zetten bij de smiley die je het beste vind passen eigenlijk.

T: Nou, ongeveer deze twee.

Y: Je moet er eentje kiezen.

Educational potential of reviews

T: Dan doe ik wel deze.

Y: Een 4. Oké. En waarom geef je dat cijfer?

T: Uhm, ja sommige stukjes vind ik niet echt, uhm, heel erg, uhm, leuk. Uhm, en sommige stukjes vond ik wel best leuk.

Y: Hmm, hmm, en welke stukjes vond je dan bijvoorbeeld wat minder leuk?

T: Uhm, bijvoorbeeld met Rondje Nederland, dat eerste stukje. En, uhm, uhm, uhm, ja eigenlijk verder bijna niks.

Y: Oké, en waarom vond je dat stukje wat minder leuk, kun je dat een beetje uitleggen?

T: Ja, eigenlijk kan ik het niet heel erg goed uitleggen.

Y: Je vond het gewoon wat minder leuk. Wat vond je dan wel wat leuker aan de video ?

T: Uh, gewoon de rest wel.

Y: Hmm, hmm.

En wat vond je daar dan wel leuk aan?

T: Uh, bijvoorbeeld ik houd heel erg van dieren, uhm nou niet echt van boeren, maar ook wel een beetje. Ik houd gewoon heel erg van dieren en ik vind het best leuk om een keer daar wel een beetje een beetje te werken en een beetje gewoon met hun meedoen.

Y: Hmm, hmm.

T: En ja ik vond het gewoon heel erg leuk.

Y: Ja dat je dus eigenlijk een beetje een inkijkje kreeg in wat er gebeurt op een boerderij waar alle dieren zijn.

T: Ja.

Educational potential of reviews

Y: Oké, uhm wat zou je veranderen aan het filmpje zodat je iets meer van 4 naar deze kant zou gaan? Waardoor zou het leuker worden ?

T: Eigenlijk, uhm, zegmaar, uhm, eigenlijk vond ik dit van het filmpje

Y: 3?

T: In plaats van dit, maar en als het wat anders ging vond ik het misschien wel deze of deze.

Y: Hmm, hmm, dus als het wat anders zou zijn dan zou je een 2 of een 3 doen ?

En wat zou ik er precies anders aan moeten maken?

T: Uhm, ik zou dan uhm, na Rondje Nederland, eerder een beetje niet echt schreeuwen maar gewoon....

Y: Iets rustiger eigenlijk?

T: Hmm, hmm.

Y: Oké. Nou, oké dat is wel een punt dat veranderd kan worden natuurlijk, ja. Zijn er nog andere dingen die je anders zou doen?

T: Nou, dat je bijvoorbeeld ook wat meer uhm, dat je wat meer informatie herinnert dat je er ook wel wat meer in kan doen, dat ze, en ook best wat moeilijker ook.

Y: Hmm, hmm.

T: En ja, dat was het eigenlijk een beetje.

Y: Ja, dus wat meer informatie over de boerderij en wat moeilijkere informatie.

T: Ja.

Y: Dat vooral.

T: Ja.

Educational potential of reviews

Y: Oké, dan zijn dingen die ik goed mee kan nemen, ja.

T: Ja.

Y: En, nou dan komen we bij de volgende vraag. Kun je ook aangeven op de kaart hoe leerzaam je de video vond?

T: Uhm, uhm, ja, best goed opzich.

Y: Een 4?

T: Aan de ene kant ook een beetje een 5. Uhm, dus het wordt denk ik deze.

Y: Een 5, oké. Dus je vond het nou niet echt heel erg leerzaam eigenlijk?

T: Nee.

Nou een klein beetje, want sommige dingen wist ik eigenlijk helemaal niet maar je vergeet het daarna eigenlijk ook wel.

Y: Hmm, hmm. Dus je was eigenlijk heel snel dingen vergeten uit de video?

T: Ja.

Y: En hoe komt dat denk je?

T: Uhm, misschien omdat het snel is of uhh, je kunt ook bijvoorbeeld met Word dat in het filmpje zetten en dat je dan, dat het dan heel veel herhaald wordt. En dat er dan een paar vragen in de video staan. Dat, en dat je dan mag typen. Wat je ervan vindt, dat kan ook.

Y: Ja.

T: En je kunt ook, uhm, bijvoorbeeld, uhm, je kunt ook ehm in plaats van een brief kun je het ook digitaal doen maar een brief kun je... ik hou ook heel veel van schrijven dus dat vind ik eigenlijk ook wel heel leuk.

Y: Ja, dus eigenlijk een soort schrijfoopdracht?

Educational potential of reviews

T: Ja.

Y: Oke, ja dat vind ik best wel een goed idee om er ook vragen in te doen bijvoorbeeld. Ja, dus en zijn er nog andere dingen die je met Word zou doen om in het filmpje te doen?

T: Misschien een PowerPoint ofzo?

Y: Hmm, hmm.

T: Dat doen wij, dat doen wij natuurlijk ook met presentaties gaan doen maar ik weet niet echt hoe het werkt maar je kunt ook wel anderen vragen of jij weet het zelf.

Y: Hmm, hmm.

T: Maar ik weet er eigenlijk bijna niks van hoe je er plaatjes in zet enzo.

Y: Hmm,hmm.

T: Maar Crello daar kun je volgens mij ook een poster maken.

Y: Oke, nou dat is ook een goede tip.

T: En daar kun je zelfs een eigen account maken.

Y: Oke, nou dat is wel een goede tip.

T: Wel met een C.

Y: Oke, Crello met een C. Ik ga het opslaan.

En, uhm, nou we hadden net over onthouden maar heb je zelf ook bijvoorbeeld speciale dingen gedaan om dingen te onthouden uit het filmpje?

T: Nou, eh, sommige dingen wist ik ook al maar sommige dingen heb ik ook uit het filmpje een beetje gehaald.

Y: Hmm, en hoe zorgde je ervoor dat je die dingen onthield zodat je het sornet bijvoorbeeld met de vragen kon opschrijven?

T: Want, eh, ik denk dat het bijvoorbeeld komt dat die vragen misschien later kwamen, want je hoort heel veel anderen en dan weet je het uiteindelijk eigenlijk niet meer en dan moet je daarna ook nog eh, uhm, ja, zegmaar een beetje wachten en dat zou ik ook eigenlijk wel doen, dan moet je wel wachten, want ja, we kunnen het allemaal tegelijk doen, anders ga je, ja,

Y: En hoe bedoel je het wachten precies, het wachten op de vragen of wachten als je het filmpje kijkt?

T: Uh, de, eh, het wachten bij de, eigenlijk het wachten bij het blaadje, datzelfde eigenlijk ook doen maar dan vergeet je het wel een beetje.

Y: Ja dat is misschien wel sneller zo.

Oke. Zou je zelf, heb je ook andere tips voor mij zodat je meer van het filmpje kan leren? Zodat je van de 5 meer naar deze kant toegaat?

T: Hmm, ja eigenlijk wat ik net al zei dan ga je een beetje hier naar toe, in het midden ongeveer niet, ongeveer deze niet maar ongeveer aan deze, eentje kiezen.

Y: Ja, twee, drie of vier?

T: Hm, hmm.

Y: En hoe zou je daar naar toe gaan ? Wat zou je voor tips geven zodat je er nog meer van leert?

T: Ik zou dan misschien meer bladen maken en dan steeds moeilijkere vragen en als je eentje niet weet dan zet je gewoon weet ik niet of een vraagteken of zet je gewoon niks op. Want als je bijvoorbeeld niks erop zet en soms dan, dat kan, je kunt ook eentje dan per ongeluk overslaan maar ik heb het met vraagtekens gedaan.

Y: Ja.

T: En als je m wel weet en eigenlijk een beetje vergeten bent dan ja, dan heb je er bijna eigenlijk niet veel aan. Dan heb je eigenlijk minder vragen.

Y: Ja, ja, ja. En wat zou je dan kunnen doen om wel het antwoord te weten op de vragen?

T: Uhm, ja, je kunt het weten door ehm, zegmaar, uhm, beetje uhm, de antwoorden op een ander papiertje te zetten, bij blaad 1 en opdracht 1,2,3 enzo zou ik een beetje doen en dan kan je precies het weer terugvinden.

Y: Ja, dat zou ook zeker een goede tip zijn. Nou ik denk dat ik nu eigenlijk al heel veel te weten ben gekomen nu, de tijd is ook voorbij zag ik al.

Zijn er verder ook dingen die je kwijt wilt over het filmpje?

T: Uhm, eigenlijk niet echt veel. Een langer filmpje, eh ja een langer bladje en antwoorden. Ja.

Y: Nou, oké dan ga ik dat meenemen voor een volgend filmpje. Nou in ieder geval heel erg bedankt.

L43

Y: Kun je op de kaart aangeven hoe leuk je de video vond?

L: Middelmatig.

Y: Middelmatig: een 4. En waarom geef je dat cijfer?

L: Omdat ik meer van spelletjes hou.

Y: Hmm, hmm. Dus je houdt er niet zo van om video's te kijken eigenlijk?

L: Ja, maar wel op YouTube.

Y: Wel op YouTube?

L: Ja.

Y: En wat vond je bijvoorbeeld leuk aan de video? Zoals YouTubevideo's vind je wel leuk, en zaten er ook dingen in deze video die je ook leuk vindt aan YouTubevideo's en die ook in deze video zaten?

L: Eigenlijks niet zoveel andere dingen.

Y: Oké.

En kun je ook uitleggen wat je wat minder leuk vond aan de video?

L: Nee.

Y: Nee, niet echt?

Maakt niet uit.

Wat zou je voor tip aan mij geven om de video wat leuker te maken, zodat je iets maar naar de 3, de 2, of de 1 toegaat?

L: Uhm,.

Y: Dus dat je het net zo leuk vind als om een spelletje te doen eigenlijk ?

L: Ik weet niet hoe ik dat kan uitleggen.

Y: Nou, probeer maar eens.

T is niet goed of fout wat je zegt, dus het maakt niks uit.

L: Om het iets makkelijker te maken.

Y: Hmm, hmm. Dus dat het iets minder moeilijk is ?

L: Ja.

Y: En wat zou je vooral wat makkelijker willen?

L: Op de boerderij, wat ze op de boerderij deden.

Y: Dus dat dat iets makkelijker wordt uitgelegd eigenlijk?

L: Ja

Educational potential of reviews

Y: Oké, nou dat is wel een goede tip.

En kun je ook op de kaart aangeven hoe leerzaam je de video vond?

L: een 1.

Y: Een 1, en hoezo geef je dat cijfer?

L: Omdat ik het best wel leerzaam vond en alleen ik vond het wel een beetje moeilijk. Ik snapte het niet heel erg.

Y: Dat is ook niet heel erg, maar oké. Uhm, heb je zelf ook tijdens het kijken ook speciale dingen gedaan om meer te onthouden uit de video?

L: Nee.

Y: Dus hoe ging je bijvoorbeeld de vragen beantwoorden?

L: Dat kan ik niet uitleggen.

Y: Waren er speciale dingen waar je toen aan dacht?

L: Uh, nee.

Y: Niet echt

Uhm, wat zou je veranderen zodat je eigenlijk meer leert, dus nouja nog meer leert als de 1 eigenlijk?

L: Eigenlijk wat ik net zei, dat het wat makkelijker wordt.

Y: Dus makkelijker, dus dan zou je er ook meer van leren?

L: Ja eigenlijk vond ik die van net een 2 nog.

Y: Ja.

L: Dat het nog moeilijk was. Dat ik het niet echt snapte.

Educational potential of reviews

Y: Nee, dat is zeker wel goed als het net wat makkelijker is kan het zijn dat je er net wat meer van leert eigenlijk.

L: Ja.

Y: Ja, ja, ja.

Uhm, nou eigenlijk weet ik al zo heel veel dus dat was al weer het einde van het gesprekje.

Uhm, in ieder geval heel erg bedankt.