How is student motivation in preparation for class positively affected when digitally supported preparation materials are made available?

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How is student motivation in preparation for class positively affected when digitally supported preparation materials are made available?

A qualitative study of students’ motivation and the effects on this by the use of selected digital materials versus textbook preparation materials.

Jane Bang & Tine Juhl Wade, December 2019
Abstract

The purpose of this study was to gain knowledge about the effects of textbook-based preparation versus digitally supported preparation. The intent was to see how student motivation in preparation for class was affected when digitally supported preparation materials were made available.

Eight students were selected using a non-probability sampling method based on a VARK-learning style test – Four international students representing the AP Marketing Management Program and four Danish students representing the BA International Sales and Marketing Management Program enabling a wide range of in-depth insights. Two different setups were used: 1) A digital version of a textbook (e-book), and 2) Animation videos, podcasts, info slides and a physical textbook as possible supplement.

The findings of this empirical study indicate that student motivation for preparation is positively affected with the availability of the digitally supported preparation materials made available in this study.

Data driven coding was applied to the initially transcribed and inductively reviewed in-depth interviews, and subsequently five key categories were identified: Increased accessibility, Different Layout/Composition, Connection with in-class activities, Variety of methods and Personal connection. These categories are discussed theoretically and visually illustrated in figure 4. Findings indicate positively affected motivation across the extrinsic-intrinsic motivation continuum – with signs of improved intrinsic and extrinsic motivation as well as positively influenced drivers of internalization of motivation.

Keywords

Digitally supported preparation, positively affected student motivation in preparation, improved intrinsic and extrinsic motivation, ebooks, podcasts, videos, AP and BA students, VIA University College
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1 Introduction
As senior lecturers on the BA International Sales and Marketing Management Program and the AP Degree Marketing Management Program at VIA University College, the researchers of this study have experienced an increasing problem with students being unprepared for classes where traditional textbooks and academic articles have been the only preparation materials supplied. The experience is that it has become increasingly difficult to achieve an appropriate level of time and effort devoted by the students to studying outside of classes.

In this study, traditional textbook preparation is defined as an instruction from the lecturer to the students to read specified written materials before attending class. This could for example include books and academic articles, where the form of communication is purely text, and where no other forms of materials or communication are supplied. Although pictures / illustrations / figures can appear in connection with text, text is the main form of communication.

Since engaging students in using this preparation method has grown increasingly challenging, a large proportion of students attend classes with a lack of basic understanding of the subjects addressed in the learning objectives, and similarly a lack of overview of the subjects’ coherence (see Figure 1).

Figure 1: The researchers’ perceived effect of low student motivation for traditional textbook preparation

Source: Own creation

Subsequently, an undue proportion of in-class time, when students and lecturer are together, must be spent explaining and exemplifying the basics of a subject, in order to create conceptual understanding. Consequently, this leaves an insufficient amount of time for students to work with the subjects in class – meaning actively applying theory to relevant business issues. This, in turn, leaves the students with an insufficient learning outcome (See Figure 2).

Figure 2: Consequence of low traditional textbook preparation on in-class activities and learning outcome

Source: Own creation
It seems apparent to assume, that if students were better prepared and subsequently more in-class time could be spent on applying knowledge gained, a higher learning outcome could be achieved.

A number of reasons could be the cause of the described problem of a low degree of student preparation where traditional textbook materials are supplied. For delimitation purposes, this study works with the hypothesis, that:

**H1:** A central reason for the low degree of preparation is founded in a lack of motivation for the method of preparation; Traditional textbook preparation.

Both researchers have previously experimented with the use of digital tools – both during in-class time, and for the students’ preparation phase. Generally, it is the researchers’ perception that the students have responded positively to the use of digital tools in both cases, and this has given rise to an increased interest in a further investigation of the use of digitally supported preparation and its effects on student motivation.

Based on the interest in a better understanding of the students’ motivation in the preparation phase, the background and purpose of this research study has been established:

The purpose is to gain increased knowledge by connecting two focus areas; the students’ motivation in the preparation stage by traditional textbook preparation and a possible increase hereof by using selected digital tools.

This leads to this study’s second hypothesis:

**H2:** By introducing digital tools into the preparation phase, we can increase student motivation for preparation.

2 Literature review

The background for this study takes its starting point in the literature addressing students and their preparation as well as in the literature addressing motivation.

According to Hilton et al (2010) reading is seen primarily as a cognitive act, but also affective. They claim that cognitive and affective conditions are interconnected, interdependent, and interactive (Hilton, et al., 2010). A study by Christoffersen & Granitz (2008) found that students come to class with better knowledge of basic concepts where online tools were used, as they studied the effects of a variety of online tools. They found that the use of such tools freed up time (in class) to discuss the models studied and the insights these could provide (Christoffersen & Granitz, 2008). They conclude that the use of online/digital components, or “tech” as they name it, can enhance student engagement, but that the integration of “tech” throughout the course and the connection with the overall learning environment is a co-dependent factor in terms of a positive outcome (Christoffersen & Granitz, 2008).

“Using a variety of online tools and online chapter quizzes can increase the amount of time devoted to a course....” (Christoffersen & Granitz, 2008)

According to Jones (2011) US Publishing executives expect digital to overtake print sales by 2014. This is followed by the fact that in some universities faculty no longer give students a choice; In connection with enrollment a bill for the purchase of e-textbooks is automatically created (Osborne, 2012).

Peng (2009) conducted a study using an online homework system to submit homework in with the aim of measuring the role of cognitive need, computer efficacy and perception amongst the students. The results suggested that student intrinsic motivation (along with computer efficacy) are important factors when detecting effort (Peng, 2009).
In summary, the above mentioned studies indicate that digital plays an increasingly important role in learning environments.

Of interest to this study is the subject of what can be done to encourage students to engage in preparation for class - gaining a better understanding of basic concepts during preparation time, thus freeing up time for activating and applying knowledge during in-class time – as illustrated in Figures 1 and 2. Can an increased use of digitalization create a different didactical and digital culture that supports students’ learning processes and independent study activities performed prior to in-class time – during the preparation stage?

Motivation seems to be a missing link in the equation of engaging students in preparation for in-class activities. According to Ryan & Deci (2000) motivation means:

“...to be moved to do something...Someone who is energized or activated toward an end is considered motivated” (Ryan & Deci, 2000)

Motivation can be divided into sub categories, and for use in this study the terms intrinsic and extrinsic motivation are set out to elaborate on what goes on when students are motivated to prepare for classes.

**Intrinsic motivation** is defined as:

“doing an activity for its inherent satisfactions rather than for some separable consequence” (Ryan & Deci, 2000)

This is supported by (Sweet & Guthrie, 1996) whom talk about goals coming from inside the reader that is generated by the personal interests and experiences and can be developed into reasons for reading.

“Intrinsic reading motivation goals include curiosity, involvement, and challenge” (Sweet & Guthrie, 1996)

**Extrinsic motivation** is defined as:

“... a construct that pertains whenever an activity is done in order to attain some separable outcome” (Ryan & Deci, 2000)

This definition seems supported directly with regards to the activity of reading (Mathewson & Wigfield, 1994) as they claim that motivation for reading can be generated by extrinsic factors, - when reading to obtain recognition and rewards or to avoid a punishment, this is based on extrinsic motivation. The goals of compliance and competition are also mentioned in connection with extrinsic motivation (Mathewson & Wigfield, 1994). Ryan & Deci (2000) emphasize the role of a separable outcome as being the deciding reason for a person to be moved towards action in what they define as external motivation.

Further, Ryan & Deci (2000) expand on the complexity of extrinsic motivation as they sub-categorize extrinsic motivation into four sub-categories and place these in a continuum - with the sub-category “Integration” being the closest to Intrinsic Motivation, and “External Regulation” being the farthest from Intrinsic Motivation. Indeed, several factors and terms are used to describe the continuum from “Amotivation” through the four categories of Extrinsic motivation to Intrinsic motivation (Ryan & Deci, 2000). This allows for a nuanced picture of the grounds on which motivation is based.
How is student motivation in preparation for class positively affected when digitally supported preparation materials are made available?

Figure 3 – An overview and explanation of the categories of motivation

Source - Adapted from Ryan & Deci (2000) and Koestner & Hope (2014)

Of great relevance to this study are the identified drivers of motivation, the elements, which allow for an increase in internalization and integration of motivation (Ryan & Deci, 2000) – in other words, the factors we as lecturers can seek to positively promote and facilitate in our aim of increasing students’ motivation.

**Competence** – feeling of self-efficacy, providing challenges that the students feel capable of overcoming, providing feedback that promotes effectance, and avoiding demeaning evaluation (Ryan & Deci, 2000)

**Autonomy** – feeling of choice and influence, providing the students with choice and influence, as opposed to a more controlled learning environment (Ryan & Deci, 2000)

**Relatedness** – feeling of belonging and connection, providing students with respect and a sense of being cared for by the lecturer (Ryan & Deci, 2000). Support by empathic rather than directive others creates the best chances of successful and adaptive striving for goals (Koestner & Hope, 2014)

Not all activities can be driven by intrinsic motivation. However, a strive towards fulfilment of the above factors can facilitate a move in the right direction, thus improving motivation. Ryan & Deci (2000) expand on the benefits of the facilitation of the above by adding, that the higher the level of autonomy in extrinsic motivation the greater the engagement, the better the performance, the greater the psychological well-being, and the higher quality of learning is achieved. Similarly, relatedness –the sense of belongingness and connectedness, is described as “the groundwork for facilitating internalization” (Ryan & Deci, 2000).

In summary, the literature reviewed for this study has included a review of selected studies addressing the use of digital elements, where focus was centered around students’ learning outcome. Secondly, theory on the subject of motivation has been reviewed and assessed in relation to the context of this study.
To the best of the researchers’ knowledge, the combination of these topics - motivation, motivation for preparation, motivation for preparation with digital elements as opposed to textbook-based preparation does not appear to have been studied previously. Hence the need for this study, which seeks to address this gap.

3 Purpose and problem formulation

3.1 Purpose of the study
The purpose of this study is therefore to gain knowledge about the effect of textbook-based preparation versus digitally supported preparation, and in this connection to establish how the latter impacts students’ motivation to prepare for in-class activities. In other words, it is the aim to obtain knowledge and understanding of the effects on students’ motivation when introducing different types of digital materials in comparison to using predominantly written materials in the preparation stage.

The test of the hypotheses presented above is believed to be of broad interest to lecturers, and of particular interest to lecturers working with the use of digitally supported activities during the students’ preparation for in-class activities.

3.2 Problem formulation
The question to be answered in this research is therefore:

How is student motivation in preparation for class positively affected when digitally supported preparation materials are made available?

3.3 Definitions
For use in this study, the following definitions are helpful to explain:

Textbook preparation is preparation using written materials only (physical books, articles)

Digitally supported preparation consists of two formats in the experimental set-up for this study:

Setup 1: Digital version of a textbook (e-book) which included some interactive features (quizzes, flip-cards, integration of external materials, read-out-loud function amongst other elements)

Setup 2: Animation videos (4 x 10-15 minutes), Podcasts (4 x 20-25 minutes), info slides (4 sets), a physical textbook was referred to as possible supplement.

4 Methodology
The research design chosen is qualitative research using in-depth interviews. The aim is to uncover students’ underlying reasons, feelings and perceptions about the use of the selected digital tools in the preparation stage, and how this has affected their motivation to prepare for class.

4.1 Empirical field
One of the researchers lectures two international classes on the AP in Marketing Management Program, and the other lectures a Danish class of the BA in International Sales and Marketing Management Program – both at VIA University College, Campus Horsens, Denmark. Since this research is based on testing new ways of offering preparation to students, the researchers decided to carry out the research on their own students. Considerations for this decision include the issue of practicability - the study being realistically possible to carry out. It was considered unduly difficult to control the experiment if other lecturers were to carry out the...
experiment, let alone convince such lecturers to conduct their course, or at least the preparation materials, differently if they were not themselves motivated to do so. It was therefore decided that respondents should be found in these three different classes, from these two closely connected programs. This presented the opportunity of including both international and Danish students in the empirical field – increasing the diversity, and therefore promoting relevance of the results.

4.2 Selecting respondents
In order to qualify the selection of the respondents, with the aim of gaining a wide range of in-depth insights, all students in the target population initially completed a VARK-learning styles test (VARK, n.d.). This, in order to firstly indicate preferred learning styles, and secondly to enable the selection of eight respondents whom differed in their displayed preferred learning style(s). It was assumed, that by including as many different preferred learning styles as possible, a wider range of insights - views and thoughts – could be generated. Representativeness was not strived for, instead - width and depth of insights was.

Eight respondents (four Danish and four international students) were selected by a selective, non-probability sampling method (Saunders, et al., 2016). Choosing respondents from both programs, Danish and International, created an empirical field displaying different preferred learning styles, which made the research wider in scope, enabling a wider range of in-depth insights.

4.2.1 Specifications of respondents
AP Program students (International): 1 x multimodal, 1 x aural, 1 x kinesthetic, 1 x read/write
BA Program students (Danish): 2 x multimodal, 1 x ARK, 1 x aural (VARK, n.d.)

4.3 Interview technique
In-depth interviews were performed, and a prepared interview guide was used as a check list during the interview (Kvale & Brinkmann, 2014). This guide was flexible, and the researchers’ often asked additional in depth questions as relevant within the context of each interview. The respondents were also able to elaborate and add comments and thoughts as and when this became relevant. All interviews lasted for approximately one hour. The interviews were recorded and subsequently transcribed for the purpose of the analysis.

4.4 Data analysis strategy
The recorded interviews were fully transcribed and subsequently analyzed using an inductive approach (Gibbs, 2007). Since this study is explorative in nature, pre-defined categories were not used for the purpose of analyzing the transcribed interviews. Instead, data driven coding was applied, as the transcribed interviews were reviewed inductively, allowing for the identification of numerous themes emerging from the data. So, the interviews were coded according to the themes that emerged (Brinkmann & Tanggaard, 2015). Subsequently, in the process of reviewing the coded interviews, similarities between the codes emerged, which in turn allowed for a reduction from the initial coding into five distinct categories that appear to show five overall different effects on students’ motivation for preparation when using the digitally supported materials introduced.

Below, the five identified categories (listed in no particular order):

- Increased accessibility
- Different Layout/Composition
- Connection with in-class activities
- Variety of methods
- Personal connection
4.5 Data quality assessment
Since the researchers are also the lecturers of the students used as respondents, and the researchers themselves carried out the interviews, the results could be affected by bias. Limitation of this bias has been strived for by emphasizing to the respondents the professional context of this study, and by the choice of the researchers to interview each other's students.

Validity of the results is believed to be relatively high. During the interviews, time and effort was used to explain and explore on points as they were brought up, based on each individual respondent’s need. Thus ensuring a better understanding of the questions asked and the answers provided.

Quantifiable and descriptive data has not been strived for in this study. The exploratory nature of the in-depth interviews indicate a focus on depth of insights into sources of student motivation on the respondents of this study. The results can be seen as indications of the effects on student motivation by the use of the introduced digital materials on similar target groups. Similarly, the results of this study can be indicative of areas of interest and focus for further or similar studies with similar or different digital materials and/or similar or different target groups, and/or with different research methods.

Transparency of this study is strived for by explaining in detail the methodological choices made in this study.

5 Results and discussion
In the following, the results from each of the five identified categories will be presented and discussed in relation to their effects on students’ motivation to engage in the preparation activity. Quotations, which are representative for the respondents and the interviews in question, are used to illustrate the points made and to bring nuance to the discussions carried out.

5.1 Increased Accessibility
It appears that having access to using the materials in a wider range of contexts than previously experienced had an impact on students’ motivation to prepare. Accessibility is defined as the perceived experience of being able to prepare with the use of the materials supplied in Setup 1 or 2 more often and/or in additional settings than was perceived possible with access to only traditional textbook preparation.

5.1.1 Expansion of time and place
The access to the materials available in Setup 2 (podcasts, animation videos, info slides) appears to have facilitated the expansion of time and place where preparation materials were engaged with, and it appears that the dimensions of time and place in connection to access to engaging with the materials had an impact on student motivation. Some students expressed that being supplied the digitally supported materials facilitated their preparation at times and in places that traditional textbook materials didn’t. This will be illustrated in more detail in the following.

One student talked about the morning commute, in a comparison between their experienced preparation behaviour with traditional textbook materials and to that of the digital materials. In the following quote, the use of podcasts was being addressed.

“at 7 in the morning you don’t want to get the book out .. it’s still dark outside you know, and it’s too much. Yeah that’s easier - Just stare at the person in front of you on the bus or, and just have the headphones on.” (Respondent, Setup 2)

As the quote above suggests, the time period that was utilized for preparation in this case was relatively close in time to the studies – as the preparation happened on the commute to the university college. The “competence” facilitator of intrinsic motivation (Ryan & Deci, 2000) appear to have been positively affected.
in this student’s expressed perception – the belief that this preparation method (podcast) is one that they feel they can overcome in the context of the commute.

Still addressing the use of the podcasts available in Setup 2, another student expressed this similarly, but in a time period, which is one step further away from the direct connection to the studies.

“I was listening to them also on my way of going somewhere.. I was going to the shop for example or something and I was like yeah, let’s listen to some podcast” (Respondent, Setup 2)

No separable outcome is being expressed as the reason for engaging in this activity – the choice to listen to the podcast on the way to a shop. It rather indicates an impulsive decision, indicating that this student was motivated to engage in this preparation activity for its “inherent satisfaction” (Ryan & Deci, 2000) – a sign of internalized regulation of behaviour, which is the basic requirement of intrinsic motivation.

Another student illustrates the expansion of time and place when preparation is engaged with, as they included a somewhat surprising time and place setting for preparation to have taken place.

“I can’t sleep .. ha ha (laughing) .. so sometimes I pick up my phone and I looked at a video or listened to a podcast.” (Respondent, Setup 2)

This indicates that the motivation to prepare has been activated at another step away from the direct connection to the studies (in the dimension of time). It seems plausible, that a slight connection to the “Autonomy” driver of intrinsic motivation (Ryan & Deci, 2000) can be drawn, since the student’s choice between several preparation methods allowed the podcast option to fit in the context described.

Similarly, a student in Setup 1 comment on the perceived increase in the possibilities of accessing preparation materials.

“The fact that it is a digital book makes it a bit easier to both access it on an iPad, a telephone and a computer. Then I can bring it with me everywhere, instead of a big book that I have to carry around.” (Respondent, Setup 1)

5.1.2 Shorter distance to connect

Another dimension of accessibility appeared in connection with the materials and the students themselves. It appears that the students perceive a shorter distance to connect with the digital materials than the traditional textbook materials.

“I can always click on something ... click, click, boom, and I had it.” (Respondent, Setup 2)

“I think it’s easier. It’s just all in front of you” (Respondent, Setup 2)

“I start to like it, because then I can just flick and flick the pages, next section, next section... Then I can just mark it up, copy it to Google translate if I need to. It’s much easier than if I had to have a physical book.” (Respondent, Setup 1)

It seems contradictory that the perceived distance to connect with the digital materials is shorter, since one might argue that a traditional textbook is similarly “all in front of you”. However, the students in question are not occupied with this. This in itself illustrates another contradiction - between what is the perceived experience of the students and what might be lecturer’s expectations of what students experience and perceive.

The three quotes above indicate signs of “competence” (Ryan & Deci, 2000) being a facilitator of intrinsic motivation to engage with the preparation activity, since self-efficacy, the students’ feeling of ease, being able to carry out the activities, is expressed in all three.
In summary, the accessibility of the digital materials appears to have had a positive effect on students’ engagement in the preparation activities, as the factors “competence” and “autonomy” and general signs of intrinsic motivation have shown to be present and to have positively influenced the students’ motivation to prepare.

5.2 Different layout and composition

Different students displayed different preferences on how to prepare, which methods they found most motivating. The category of layout and composition of the material for preparation clearly appeared to have an impact on the motivation to carry out the preparation activity.

The different text set-up in the info slides in Setup 2 in comparison to that of a traditional textbook was commented on, as the following quote indicates a difference in perception of the preparation activity between the two methods in direct relation to this.

“It’s just set up differently than just a text. It’s kind of visualized rather than just reading a text” (Respondent, Setup 2).

Similarly, this is addressed by another respondent:

“It’s more interesting for me. More into details....And I as I said, I can visualize that idea or what was written in the book” (Respondent, setup 2).

“it” refers to the preparation for class. Here, the respondent identified that having this different set up makes it more interesting to engage with the preparation. Signs of internalization and intrinsic motivation is shown in the fact that the student mentions that their interest in the preparation activity itself is increasing with this method.

Setup 1 with the e-book opened up for the possibility of placing articles as files directly into the chapter pages where the lecturer found it relevant to include. Some of the students expressed this feature as increasing the likelihood of preparation.

“The likelihood of me preparing the articles is bigger when they are placed after each chapter in the e-book” (Respondent, setup 1).

“You have everything collected in one place, book, articles and other things, and this makes me prioritize this compared to other things....” (Respondent, setup 1).

“...If things are gathered in one place it affects my motivation to prepare...It’s again something about time” (Respondent, setup 1).

The respondent who generated the last of the above three quotes continued to talk about spending less time on preparation when the materials are gathered in one place and explained how this positively affected the respondent’s motivation for preparation.

The three quotes above show signs of “Competence” as a driver of motivation (Ryan & Deci, 2000), as it appears that the students in question find the activity of preparation more approachable more manageable, easier to overcome - with the reason that everything is collected in one place.

Another student, provided with the e-book of Setup 1, emphasized the effects on their motivation by the feature of showing the reading progress at the bottom of the page:
“At the bottom there is….you know every time you change pages you can follow these ticks….and I don’t know….this really motivates me. Just like in games…you have reached a level and can move on” (Respondent, setup 1).

The student refers to the similarity with games being a motivational factor for carrying out this preparation activity. Thus, the activity itself is perceived to have an element of enjoyment, a sign of intrinsic motivation being positively affected (Ryan & Deci, 2000).

The e-book also gave the opportunity of clicking the link in the content page and being directed to that particular section in the book. This was commented on by the following student:

“It was just going into the book and click the link to chapter 4. Then it just appeared immediately (....) I would definitely choose the online book instead of the printed book”. (Respondent, Setup 1)

This was expanded on in the following:

“...in the printed book you cannot have these flip-cards, which you have in the online version. So this is something extra” (Respondent, Setup 1).

“Now I’m sitting with an iPad instead of a book, so I can bring it more places. So it makes it easier when you have to read” (respond, setup 1).

In connection with the layout and composition, some students brought up the subject of how this particular e-book was written and how the content was structured. Although this was not a direct focus of this study, it seems relevant to include here as an element, which the students in question found to influence their motivation to engage in the preparation activity. Several respondents touched upon this:

“It’s just the thing that there is so much text....I know that there is much text in the online book, but it’s set up in a different way that makes it more manageable” (Respondent, Setup 1).

“I have been wanting to prepare more with the online book. But this is because there is not so much text in the book” (Respondent, Setup 1).

It appears that the to-the-point format and structure made the preparation task more manageable. This shows signs of the “Competence” driver of motivation being positively effected, since the respondent indicates an ease of overcoming the task (Ryan & Deci, 2000).

In summary, different elements of layout and composition of the digital materials appear to have positively influenced students’ motivation to engage in preparation activity. The “Competence” driver of motivation and signs of intrinsic motivation are shown to have been positively affected.

5.3 Connection with in-class activities

It became clear that the evaluation of the effects on motivation caused by the digital materials were difficult to isolate entirely. In setup 2 (podcasts, animation videos, info slides) some students described a connection between in-class activities and the materials provided for preparation on their motivation for preparing.

“to follow what she was talking about you had to go through the material first” (Respondent, Setup 2)
“the material that we went through in class was an explanation of what we had to do at home so if we missed that then wouldn’t be able to follow in class” (Respondent, Setup 2)

“It goes somehow together. It’s the whole package” (Respondent, Setup 2)

In-class time in setup 2 (podcasts, animation videos, info slides) was conducted in a flipped-classroom style, in line with the wish to spend more in-class time on the application and activation of knowledge. Therefore, it is important to take into consideration that when evaluating the effects on motivation the overall setup has a role to play on the students’ motivation for preparation. However, the quotes above indicate drivers of motivation within the extrinsic category, where the wish to achieve a separable outcome is the driver for engaging in the activity (Ryan & Deci, 2000). This is indicated most clearly in the first two of the three quotes above, as they both present the goal of being able to follow what was to happen in class – a separable outcome.

In summary, the connection between the materials supplied and the in-class activities appears to have had a positive impact on the motivation to engage in preparation. Signs of extrinsic motivation being facilitated are shown, and the drivers of motivation are found in the “approval from self or others” and “conscious valuing of the activity” (Ryan & Deci, 2000) – thus situated in the middle of the extrinsic motivation continuum (Introjection / Identification - see Figure 3).

5.4 Variety of methods

The study indicates that motivation can be positively influenced by offering the students a variety of methods in their preparation.

Several of the students in setup 1 touched upon the fact that they liked the opportunity of taking quizzes in the online book and using other sections of the book to expand their understanding. The quiz allowed them to see immediately if they had understood the concepts of the prepared material, which seems to have positively affected their motivation for preparation.

“It’s actually the quizzes that give me motivation to prepare …and the rest of the aids to help you out if there is something you don’t understand” (Respondent, Setup 1).

The quotation above indicate the driver “Autonomy” being successfully facilitated, since the student describes how they used one preparation method (the quizzes) for one purpose, and another preparation method (the rest of the book) for another purpose, according to their own wish.

Students in Setup 2, offered preparation through podcasts, videos and info slides, similarly described positive effects of the variety of methods available and the combined use of such:

“I mean sometimes it’s a bit boring just sitting down just having a book. It’s easier to maybe just listen and like yeah do something else while…maybe switch like being on the computer for an hour and then stand up and listen to something. It has a better flow than just sitting the whole day”. (Respondent, setup 2).

“I get the material three times in three different ways and that helps way more than the book” (Respondent, setup 2).

“It’s just easier to just get it all in with these different methods. I mean I just get tired reading a book” (Respondent, Setup 2).
These respondents express a positive attitude towards preparing with the three different methods, and they indicate that the available methods are being used in combination. There were no indications that the respondents used the same order or had the same preference for one material over another (of the digital materials supplied in Setup 2). Thus, this indicates a positive effect on “Autonomy” — choice and control of preferred preparation method as and when they find them suitable for and in different contexts. This is exemplified by the examples of switching between reading and listening, as well as a physical change — listening whilst walking around. It appears that this free choice has had a positive effect on the motivation to engage in the preparation activity.

Additionally, general signs of intrinsic motivation are seen in the following quotations, where two students from Setup 1 commented on the feature of the e-book, which offers the possibility of highlighting text as well as copy/pasting sections into own online notebooks like OneNote. And one student from Setup 2 who comments on the motivation to use all of the materials offered.

“You have the flip cards and all quizzes, notes and highlights and much more...so you just want to read them!” (Respondent, Setup 1).

“I get further with my preparation with these features. I read this online book to the end. I don’t stop my preparation” (Respondent, Setup 1).

“I felt like, like I wanted to use all of them - not just listen to the podcast or the videos...” (Respondent, Setup 2).

The quotations above explicitly points out that the preparation activity is sustained, as is illustrated by the quotation “I get further with my preparation...”. It seems that this directly exemplifies the effect of “Autonomy” on motivation to carry out the preparation activity. Additionally, the quotations above show signs of intrinsic motivation being positively facilitated, since the sentences, “you just want to read them”, and “I felt like, I wanted to use all of them” indicates that the preparation activity itself is enjoyable, without the need for a separable outcome as a driver for action.

In summary, there is an indication that offering a variety of methods for preparation does affect the motivation in a positive direction for the respondents of this study. Having the opportunity of switching from reading, either in an online book or info slides to watching a video, taking a quiz or listening to a podcast, seems to facilitate motivation. As illustrated by the quotations above, the “Autonomy” driver of motivation and signs of intrinsic motivation has emerged in this category, as they have shown to have a positive impact on students’ motivation to engage in preparation activity.

5.5 Personal connection

The dimension of indirect human contact appear to have an impact on student’s motivation to engage in preparation activities. The auditory communication in the case of podcasts and videos was perceived to create a connection with someone (the lecturer), and this was described to influence motivation positively.

“A book. It’s not a voice that speaks to me, it’s not a visualization that I have, it’s just a book. I mean it’s.. if I have to I will. But as I said, if I had the possibility to be provided with a voice, someone talking, someone showing me...it’s easy” (Respondent, Setup 2)

This quote includes a comparison of textbook preparation and Setup 2 (podcasts, animation videos, info slides) used in this study. The student expresses how their motivation differs between the two contexts, as the sentence addressing preparation by textbook “if I have to I will” indicates that a driver within extrinsic motivation, namely the goal of a separable outcome, has to be drawn upon in order to conduct the preparation activity. Specifically, the first part of the sentence, “if I have to”, indicate an externally regulated goal based on a driver of “compliance” (Deci & Ryan, 2000). With the use of the digital materials used in
Setup 2 motivation seems to have a higher degree of internalization and thus derive more closely from the drivers of intrinsic motivation, “Relatedness” and “Competence” (Ryan & Deci, 2000). “Competence”, in the sense that this type of preparation method is experienced by the student as being easier, more manageable, which is expressed in the last sentence of the quote, “It’s easy”. “Relatedness” is seen to be a driver as illustrated in both sentences within the quote – specifically within the parts “a voice that speaks to me” and “someone talking, someone showing me”.

Additional quotes similarly illustrate the personal connection as being a driver of motivation to engage in the preparation activity:

“Maybe it is because it is listening not reading. So I actually felt like someone is talking to me so I really pay attention like what is she saying. When I am reading it’s just on my own so it’s a bit boring” (Respondent, Setup 2)

“Its’ more personal. Definitely.” (Respondent, Setup 2)

“The personal factor is there” (Respondent, Setup 2)

“It’s better when someone is talking to you.” (Respondent, Setup 2)

“I take it more seriously maybe. When it’s from her, because she wants me to learn this, so.” (Respondent, Setup 2)

The quotes above indicate the driver of motivation, “Relatedness” (Ryan & Deci, 2000) being successfully facilitated, as they all address the perceived importance of being joined by someone in the preparation stage. As described in more detail in the literature review, “Relatedness” is seen as fundamental for motivation to be internalized, and the quotations above seem to confirm the importance of this.

In summary, it seems that the experienced personal connection between the student and the lecturer, or the speaker of the podcast/video, is making the students feel less alone in the preparation stage. Additionally, it appears that the personal connection has facilitated a perception of the preparation activity as being manageable, easier. Subsequently, the drivers “Relatedness” and “Competence” appears to have had a positive effect on students’ motivation to engage in the preparation activity.

### 6 Conclusion

In conclusion, this study indicates that student motivation for preparation was positively affected with the availability of selected digitally supported preparation materials. The findings indicate five categories - five different ways in which the digital materials had a positive effect on students’ motivation to prepare;

- Increased accessibility
- Different layout/composition
- Connection with in-class activities
- Variation of methods
- Personal connection

Within each of the five categories above, different signs of positively affected extrinsic and intrinsic motivation were found to be present, as were the activation of drivers of internalization of motivation; “Autonomy”, “Competence” and “Relatedness”. However, the signs of positively affected motivation appear to differ across the five identified categories, and therefore it is relevant to summarize and visualize where,
along the continuum of the different types of motivation introduced in the literature review, each of the categories are found to have had a positive effect. Figure 4 attempts to provide this overview.

**Figure 4 – Overview of categories and types of positively affected motivation across the continuum**

<table>
<thead>
<tr>
<th>Categories:</th>
<th>Signs of positively affected motivation:</th>
<th>Extrinsic</th>
<th>Intrinsic</th>
<th>Facilitators / Drivers of internalization of motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External</td>
<td>General</td>
<td>Competence</td>
</tr>
<tr>
<td>Increased accessibility</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Different Layout/Composition</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Connection with in-class activities</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Variation of methods</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Personal connection</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own production – based on motivation theory by Ryan & Deci (2000)

In the following, sources of motivation within each of the types of motivation across the continuum will be concluded on with the findings specifically from each of the five categories identified.

### 6.1 Signs of extrinsic motivation

As illustrated in Figure 4, signs of positively affected extrinsic motivation were found in the category “Connection with in-class activities”. This category showed, that not all sources of the observed increase in students’ motivation can be isolated to the use of the selected digital preparation materials. Findings from this category indicate that the setup of the in-class activities had a positive influence on students’ motivation to prepare. The setup was inspired by the flipped classroom style, due to the lecturers’ developed belief in the increased learning outcome with this style of teaching. Respondents expressed a link between the expected and experienced in-class activity and the preparation activity. They expressed that they were motivated to prepare due to wanting to be able to participate during in-class time, and in some cases they expressed that preparation was a necessity in order to participate in class. Some expressed the need to not feeling disconnected from the in-class activity. This indicated signs from within extrinsic motivation, the motivation to reach a separable outcome.

There were signs of both external and internal directions within the findings, but all within the part of the continuum belonging to extrinsic motivation. The facilitation of extrinsic motivation, whether externally or internally rooted, is believed to be an effective motivation to move a person to take action (to prepare for class in this case). However, the more general signs of intrinsic motivation are present, and the more the three drivers of motivation are facilitated, the more sustainable and long term the motivation is expected to be. Therefore, it seems apparent to conclude that it would be insufficient in the long run to rely solely on this extrinsic type of motivation source.

### 6.2 General signs of intrinsic motivation

This study also shows signs of positively affected intrinsic motivation – both general signs, and more specifically signs within the three mentioned drivers of internalization of motivation (See Figure 4 for more
detail). The three drivers of internalization of motivation will be concluded on in section 6.3 - Drivers of Internalization of motivation.

In this section, the general signs of positively affected intrinsic motivation will be concluded on. The general signs of intrinsic motivation being positively affected includes findings that indicate situations where the preparation activity is being carried out due to its inherent satisfaction. Signs that no separable outcome is the driver of carrying out the preparation activity.

Findings indicate general signs of intrinsic motivation to have been positively affected by the use of the selected digital materials exemplified in the categories “Increased accessibility”, “Different Layout/Composition” and “Variation of methods”.

Findings from the category “Increased accessibility” showed that whilst on the move, students perceive a shorter distance to connect with the preparation activity, and indicates that this facilitated a feeling of wanting to prepare — exemplified with the use of podcasts available with Setup 2.

Similarly, findings from the category “Variation of methods” confirm that some of the selected digital materials facilitated intrinsic motivation as students expressed a feeling of simply wanting to use all of the materials supplied in Setup 2, and just wanting to read the ebook in Setup 1. Explanations that indicate that the preparation activities were carried out for their inherent satisfaction, that no separable outcome was the driving force.

Findings within the category “Different Layout/Composition” show that the composition of the ebook in Setup 1 positively influenced intrinsic motivation in the way of making the preparation activity more fun. The similarity to motivation experienced in playing games, being able to visually follow one’s own progress through the chapter in the ebook, seemed to positively influence the students’ motivation to engage in and sustain or complete the preparation.

6.3 Drivers of Internalization of motivation

As illustrated in Figure 1, a move towards intrinsic motivation is achieved by the strive to fulfill the three drivers of internalization of motivation. And, as shown in Figure 4, one or more of the three drivers of internalization of motivation appear to have been positively affected in four out of five categories. This will be elaborated on in the following.

6.3.1 Competence

The feeling of “Competence” perceived by the respondents explains a feeling of self-efficacy - the expectation and experience that the students were able to manage and overcome the preparation activity. It appears that this driver of motivation has been facilitated to a higher degree with the use of the digital materials, when compared to the use of textbook preparation activities. This is explained by the categories: “Increased accessibility”, “Different Layout/Composition” and “Personal connection”.

Findings included in the category “Increased accessibility” showed that the digital materials engaged students into the activity of preparation at times and in places where a textbook didn’t – they engaged in preparation on different devices, and for example when on the move. This was found to provide less barriers to engage in the preparation activities, and so a perceived shorter mental distance to the materials was expressed.

The category “Different Layout and Composition” (in comparison to that of textbooks) also appear to facilitate a more manageable act of preparation. It was perceived to have a more to-the-point format and to
be better structured. Also, having all the materials gathered in one digital place made the preparation activity more likely to be engaged with and more likely to be sustained or completed.

The category “A personal connection”, (referring to the connection between student and lecturer) was obtained through the use of Setup 2 (podcasts, animation videos, info slides). This indicates to some extent to have facilitated a feeling of “Competence”, as it appeared that the personal delivery of contents from lecturer to students was perceived as a more manageable preparation activity.

6.3.2 Relatedness
“Relatedness” was shown to have been positively affected in connection with the findings in the category “A Personal Connection”; This connection between student and lecturer was achieved through the use of the materials in Setup 2 (mainly the videos and podcasts). This perceived personal connection was expressed in terms of feeling joined by someone in the preparation stage, and the preparation materials were perceived to be taken more seriously since it was the students’ lecturer talking directly to them. Subsequently, this personal connection appeared to play a role in students’ feeling of not being alone during this preparation, and it was expressed that this positively affected the likelihood of them engaging in the preparation activity.

6.3.3 Autonomy
“Autonomy” was shown to be a driver of motivation in relation to the two closely related categories “Increased accessibility” and “Variety of methods”.

The feeling of autonomy, having options and control over which preparation method to use, was positively affected as students described the increased accessibility of the materials as well as the variety of methods available to them as having a positive effect on their motivation to prepare. This was seen from the findings within preparation behaviour, as students appeared to use the different materials in different contexts, depending on their own situation, the time of day and the physical surroundings they were in. An example of this is found in the expressed choice of using flip-cards or quizzes to check they were on track during reading (e-book, Setup 1), and by podcasts being chosen when the context didn’t allow for watching/reading (Setup 2). The possibility of being in control, choosing the preparation method that suited them best in any given context appeared to positively influence their motivation to prepare, and to sustain preparation. In other words, changing contexts wasn’t perceived to be a physical or mental barrier for preparation with the availability of the digital materials. The free choice of digital methods facilitated this driver of motivation for preparation - in contrast to a situation with preparation by textbook only.

6.4 In summary
The findings from this study have provided insights into the effects on students’ motivation to prepare by the use of selected digital preparation materials. The findings from the empirical study of two separate setups indicate a strengthening of the hypotheses set out, as signs of positively affected student motivation to prepare were found and exemplified in five categories, which were identified from the empirical study. The categories have subsequently been discussed theoretically indicating positively affected motivation across the continuum with signs of improved intrinsic and extrinsic motivation as well as positively influenced drivers of internalization of motivation.

7 Critical and future perspectives
This study has looked into motivation of students in the preparation phase. Equally interesting to motivating students to prepare for classes would be to research whether and to what extent their learning outcome would show a similarly positive effect. Literature indicates a link between increased motivation and learning outcome (Ryan & Deci, 2000). This seems like an interesting area to explore in more detail in terms of the
present study – does the learning outcome follow an increased positive motivation for preparation? Additionally, a study of learning outcome could distinguish between surface and deep learning with the use of the digital materials introduced in this study.

A study of learning outcome, as a result of the use of the digital materials used in this study, could be carried out qualitatively and/or quantitatively. Self-reported perceived learning outcome could be investigated, and/or a comparison of grades before and after changing the methods offered in the preparation phase could similarly be investigated.

When talking about preparation it’s also necessary to reflect on how good the preparation is. Some of the students indicate that the preparation with digitally supported material is easier (Respondent, Setup 2). One of the elements that came up in relation to this is preparing on the move. Last but not least, this study has also concluded that the feeling of competence appeared due to students feeling the preparation more manageable based on the personal delivery of content from lectures to students – primarily in setup 2. A retrospective reflection on these facts is how the preparation is actually stored in the students’ mind. When being on the move and when the material is being read out loud to students, do they actually learn something – and for how long do they learn? This goes back to the previous perspective about surface and deep learning.

Since this study included qualitative in-depth interviews with eight students from the same field of studies (business), results may be different if the study was carried out with a different target group - students from different countries and/or different study programs. Students of engineering or nursing may provide different results. Additionally, it would be interesting to investigate the scope of the effects on motivation shown in this study. Would results differ with a larger target group?

Finally, it would be interesting to investigate the long-term effects on students’ motivation of the use of these methods of preparation. If these methods are used over a longer period of time, and are no longer considered “new to the world”, it would be interesting to study if and how this affects students’ motivation to prepare? To what extent they maintain the positive effects on motivation shown in the present study.

This study has strengthened both of the hypotheses set out about traditional textbook preparation not being motivating and that the introduction of digital tools into the preparation phase has increased students’ motivation in a positive direction.

This study provides a suitable foundation for larger scale projects of both qualitative and quantitative nature to unfold the indications found in this present study.
List of references


