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Reinventing the Case-method Teaching Approach Using a New Technological Tool

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ABSTRACT

We developed and implemented a visually based pedagogical approach called Visio case-method teaching (V-CMT). Data were collected from thirty business and management students using written statements, interviews, and in-class notes and observations. The data were analyzed using the inductive thematic analysis approach. Major findings suggest that V-CMT supports online learning, increases university student volume & value of learning, increases student engagement with the course content, and enhances information retention. Most of the participants suggested replicating this method in other courses. Major challenges in the implementation of V-CMT relate to a lack of time management, non-provision of a robust preamble, and limited knowledge of using MS Visio tools.

Keywords: ICEB, Case-method teaching, MS Visio tool, new pedagogy, student engagement, information retention.

INTRODUCTION

Rapid innovations in information, communication, and media technologies have gradually transformed the learning atmosphere and motivated the development of new synchronous and asynchronous teaching and pedagogical approaches. Notable among these approaches are case-method teaching (CMT), dialogue teaching (Sedova, 2017), blended learning (Cocquyt et al., 2019), game-based learning (Lew & Saville, 2021), flipped or inverted classroom learning (Gómez-Tejedor et al., 2020), simulations (Farrell, 2020), instructional video clips (Expósito et al., 2020), podcasts (Hill & Nelson, 2011), and prime-time learning (Koskinen et al., 2018). Considering the novelty and effectiveness of these approaches, the pedagogical landscape in many higher education institutions has changed. However, contemporary contributions (Krishnamurthy, 2020; Suyunchaliyeva et al., 2021) have suggested that technological advancements are not the sole motivation for pedagogical innovations; rather, unprecedented situations, such as those created by the COVID-19 pandemic, have caused faculty to revisit their pedagogical methods and establish new routines while transitioning to online learning and audience participation.

Pedagogy—defined as any conscious activity by a person to enhance the learning of another (Bashabsheh et al., 2019, p. 714)—involves how to teach (well) and pedagogical developments (either online, in-class, or hybrid). These developments are now highly prone to unprecedented incidents, computer-related technological changes, and changes in the behavior of millennial, Gen-Z, and Gen-Alpha students (i.e., the mobile generation). Collectively, these new developments and changing student behaviors have created a highly challenging and demanding atmosphere in which higher education institutions and faculty must try to upgrade and diversify their delivery techniques to meet the ever-increasing expectations of students and facilitate learning using various innovative tools. Importantly, CMT has increasingly been recognized as an excellent pedagogical solution that allows students to experience real-life situations, which enhances their learning outcomes and course satisfaction (Dorta-Afonso, 2019). Similarly, a host of empirical and experimental research investigating various facets of technology in CMT has been published in renowned journals. For example, Shin, Brush, and Saye (2019) explored the use of case methods in teaching methods. They found that most of their respondents valued case discussions with co-construction of knowledge as useful and meaningful. Based on the revised Bloom's taxonomy, Nkhoma et al. (2017) proposed the use of case studies using four constructs: knowledge application, higher-order thinking, practice evaluation knowledge, and knowledge improvement. Their findings suggested that knowledge application creates a positive impact on student's higher-order thinking.

We have extended traditional CMT via a new visual tool called MS Visio. Although, Visio tools have been used widely in various disciplines including business analytics and business intelligence (cf. Shershakov, 2021), their usage in CMT has rarely been noticed. The purpose of supplementing CMT with the MS Visio tool is to systematically convert case text to a comprehensive diagram for future use; the diagram or visuals could then be used by students as a source document that would almost completely replace multiple pages of text. According to Vilnai-Yavetz and Tifferet (2015), a person can absorb visual images sixty times faster than words or text. Moreover, most of the previous empirical studies have examined new teaching approaches at the general or university level, we have examined teaching at the course level (Uiboleht et al., 2016).

The purposes of this study were to develop and implement a new and interactive pedagogical approach called Visio case method teaching (V-CMT) and to examine the extent to which V-CMT increases students' engagement with the course content and produces better outcomes or challenges for master's degree students in the Digital Marketing and Corporate Communication (DMCC) program. V-CMT aims to provide a more effective and contemporary visual-based learning environment for university students in the online and contact teaching atmospheres. Moreover, the major pitfalls and challenges to V-CMT based on the students' opinions were examined. The research questions proposed to achieve the objectives of this study include: *1) How V-CMT benefit university students' learning, engagement, and satisfaction with the course content? 2) What are the major pitfalls of and challenges to the V-CMT approach especially during a global pandemic?*

Two research questions were proposed as the research objectives were also twofold: determining the benefits of and challenges to V-CMT. Research has used various terms to represent CMT (Afsouran et al., 2018), such as case, case method, case-based learning activities (Nkhoma et al., 2017; Popil, 2011), and case study teaching method (Popil, 2011). These terms are used interchangeably in this article. The remainder of this paper is structured as follows: Section 2 presents the case pedagogy and introduces V-CMT, the research methodology is explained in Section 3, the findings are discussed in Section 4, and the discussion and conclusion are described in Section 5.

LITERATURE REVIEW

Case Method and Case Pedagogy

Our many years of experience in academia and active publishing in the field of digital sciences and mobile technologies have led us to conclude that university students usually prefer to acquire a set of abilities and skills that can help them achieve and even surpass the academic knowledge and essential skills needed to survive and thrive in a highly competitive and diversified automated workplace. Consequently, the historical classroom-based, face-to-face CMT and online synchronous teaching strategies with passive teaching are quickly losing their usefulness. Considering this shift, the demand for a more skilful and innovative workforce compelled several universities to define their vision for the future of education and student learning (Organization for Economic Co-operation and Development, 2018; Herodotou et al., 2019) by insisting on improving learner qualities, the acquisition of necessary skills and the use of various digital tools and techniques. A growing number of scholars (cf. Clifton & Mann, 2011) also agreed that students are becoming the most potent stakeholders of education, demanding up-to-date, interactive models of teaching and support. Consequently, the traditional model of education, teaching and pedagogy is quickly shifting, and necessary changes are being introduced in pedagogical and guidance practices to increase student learning and competencies (Jääskelä & Nissilä, 2015). Among the prominent changes, CMT has been proven to be one of the best pedagogical solutions, bringing students close to real-life situations and thereby increasing their engagement with the course content and their satisfaction with the course, and improving the learning outcomes (Dorta-Afonso, 2019). The case method is considered a foundational technology in business education (Rippin et al., 2022) and CMT involves the use of cases for classroom teaching purposes to encourage the students' active participation, which will improve their satisfaction with the course and their learning outcomes (Roy & Banerjee, 2012). A case in CMT should not be considered an example or an empirical or case study (Ray, 2018); rather, a case in this method is a real-life story, event or issue that is usually unresolved and provocative in nature, does not lay down analytical methods and invites students, usually in groups, to read, analyse and engage in a process of case evaluation and decision making. CMT, therefore, helps students develop critical thinking, decision-making, teamwork, group dynamics and long-term information retention skills (Bruner, 2002). Accordingto Carlson and Valenchik (2006), CMT has three essential components: a detailed description of the situation or case, the students' preparation for discussing the case and discussion of the case in the classroom for possible resolution.

Popil (2011) encouraged the use of CMT, which has received mixed opinions about its effectiveness in increasing student learning, satisfaction, and engagement as well as its promotion of critical thinking. For example, to achieve a high level of student satisfaction, Dorta-Afonso (2019) designed a seven-session case method intervention to be used as part of an organizational behavior course and found that the participants were satisfied with the case study method, which resulted in the suggestion that this teaching method should be applied in other courses. However, it remained unclear whether the case method was appropriate for teaching certain areas of study, such as marketing, accounting, finance, and information systems (Shugan, 2006). Earlier, Powell (1994; 2000) found that CMT was a sophisticated form of instruction, but it did not allow the instructor to cover as much content as the traditional lecture method. While delving further into the limitations of CMT, prior research (Popil, 2011) suggested that CMT is a time-consuming and complex teaching method with a limited scope. The proponents of CMT, such as Harvard Business School, have remained supportive of CMT's effectiveness in classroom teaching and sharing by way of exercising leadership and teamwork while solving real problems and persuading students to think differently (Shugan, 2006).

V-CMT – Introduction and Motivation

Humans are adept at assimilating visual content and digital technologies including mobile technologies enable an ample learning resource (Svendsen & Svendsen, 2019). Recent studies (Expósito et al., 2020; Shin et al., 2019) have stated that the use of digital technologies combined with visual tools and online videos and resources (e.g., TED talks, Stukent Mimicpro simulation, and Khan Academy) have revolutionized teaching, pedagogy, and the classroom learning environment. Research (Scull et al., 2016) has also revealed that online education reduces the operational costs of universities and encourages students to take courses at their convenience. This trend is growing at an exponential rate, and higher education institutions are increasingly adapting to these changes i.e., using digital technologies in their everyday teaching. The higher education institutions are also encouraging

their faculty to participate in and learn new ICT-based synchronous and asynchronous pedagogical practices and ensure their implementation in both online and classroom settings. In the same vein, visual modelling, which was traditionally used in the IT and IS courses, including software engineering, is now being used in several management and business courses to better present concepts with the help of some visual content. The standard language used in visual modelling is called unified modelling language (UML) (Shumba, 2005). Two UML tools are used in teaching: Rose and MS Visio. Between these two tools, MS Visio, which is based on the drag-and-drop method, is considered more convenient and instinctive for most students (Shumba, 2005). In addition to its instinctive nature, several other factors motivated us to develop and implement the V-CMT approach, including the ones shown below.

1. Introducing this modified V-CMT and embedding it into everyday teaching aims to meet the changing expectations of digital native contemporary students for more tech-oriented and innovative pedagogy that differs from the traditional text-based CMT approach.
2. The hallmark of CMT is active participation by students. V-CMT was developed and suggested based on this element.
3. With the inception of podcasts, YouTube (social media), and Vimeo business models, which primarily rely on producing and sharing video content free of cost, came to a transformation in student behavior. Instead of reading text-based material, blogs, and market reports, students prefer to watch videos as well as review images, diagrams, and tables, which increase their understanding of a particular phenomenon, create more interest than relying on text-based content, increase student engagement, and relieve their cognitive resources.
4. Given that most IT tools are easily and frequently accessed and used globally, this innovative and highly interactive CMT method can easily be replicated in all countries.

Following the synchronous and asynchronous nexus, the V-CMT process comprised three stages. In the first stage, traditional CMT included PowerPoint slides with synchronous class participation. Here, the students were given an understanding of the core concepts involving a particular phenomenon or case. Afterward, they were given a real business case and a detailed factual description of a business issue faced by an organization (Shugan, 2006). All the material relating to the case study and necessary instructions were placed online using the Moodle learning management system to facilitate asynchronous learning. These case studies comprised several pages and an appendix. We discussed the case with the students and determined an appropriate action. In the second stage, the course participants were divided into small groups of five members each. Each group was given a specific section of the case to read and discuss within their group to develop their understanding. In the third stage, we explained the Visio application, used the tools, and began depicting the case in a diagram. At the end of this session, the students left the class with a diagram that summarized the case. It consisted of several pages and an appendix. Unlike text, a diagram simplifies information as well as increases students' understanding. A diagram will also yield better retention of learned material (Figure 1 depicts the V-CMT process using Visio tools.)
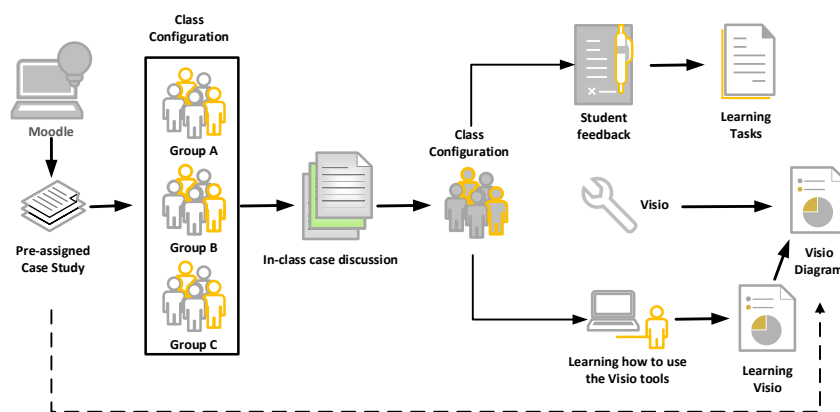
(MS Visio tools were used to develop this diagram)
Figure 1: Transition from CMT to V-CMT

METHODOLOGY

Case Selection and Description
In an era of fast digitization of products and services and the emergence of a networked economy and social media, understanding digital technologies is paramount to the survival and growth of students in the business world (Hanafizadeh & Shaikh, 2021). In line with these expectations, the universities in Finland introduced new master's programs such as DMCC.

The purpose of introducing DMCC was to meet tech-savvy students' varying needs for new technological tools in the marketing and corporate communication fields, thereby preparing them for the job market. New courses, such as Digital Marketing in Action, Digital Interaction, Digital Technologies & User Behaviour (DT&UB), and Digital Marketing Communication, were

developed and included in the DMCC program. Efforts were made by designated faculty members to revisit their pedagogical approaches and develop improvements. V-CMT was introduced in the DMCC course DT&UB, which is offered in the first year of the program during the spring semester. To guarantee a complete representation of participants, we initially utilized a method of purposive sampling. This strategy suggested by Shaikh et al (2023) provides a larger and more diverse group of participants with valuable various perspectives and experiences. Subsequently, within this cohort of participants, we applied the principle of randomization to select a subset of 7 students both male and female. This combination of purposive and random sampling ensured a fair and inclusive selection process for our study.

To understand the usability and effectiveness of V-CMT on student learning, an empirical case setting was designated for monitoring in spring 2021. In total, 30 students registered and participated in the DT&UB course. Three case studies were shared with the students in the class. At the outset, the students were informed about this new V-CMT approach as well as its implementation strategy, which was divided into three phases.

In *phase one*, the case studies were uploaded to Moodle (an online learning environment) for easy access and retrieval at least three days before the scheduled class. The class was divided into small groups of four or five members each. Each group was responsible for reading as well as critically analyzing the case study's content at their convenience. During the class, team members were randomly selected to share their opinions about the case and suggest possible solutions. To promote a healthy and meaningful discussion and support knowledge co-creation in the class, the designated faculty used various tools, including the whiteboard and MS Word, to record the students' comments and views. In *phase two*, the groups were dismantled, and all students were told to read the same case study individually and refresh their ideas and thoughts. Students were then invited to record their views while the designated faculty began depicting the case study in an easy-to-comprehend single diagram using the Visio application. In the *third phase*, a brief training on the use of the Visio application, which was also part of the V-CMT implementation strategy, was provided for the purpose of raising the students' skill levels and keeping them engaged and involved in this new teaching method.

Material and Methods
To the best of our knowledge, little is known about using visual tools when delivering a course in a university setting; the empirical research in this direction is sparse. When little is known about a specific phenomenon or practice in question, it is highly advisable to use the qualitative approach (Weng et al., 2020). The primary data, including written statements, interviews, and classroom notes/observations were collected during the spring 2021 semester. The data collection process was divided into two phases. During phase one, the students were advised to write and submit a one-page learning diary sharing their learning experience with V-CMT. Students were offered extra credit (5%) for completing this task. To receive meaningful feedback on V-CMT, all students were explicitly asked to answer the following questions when writing and submitting their learning diary:

- How did you find V-CMT?
- Did V-CMT increase your volume of learning about a specific case study?
- Did V-CMT provide a complete picture of the case?
- Did V-CMT make it easy to remember and retain the information in the case study?
- Was the diagram that was developed at the end of using V-CMT easy to comprehend?
- What was flawed or complicated about V-CMT? And would you support the continued use of V-CMT in this course as well as replicating the same procedure in other courses/disciplines?

In phase two, seven students were randomly selected and invited for an in-depth, semi-structured interview concerning V-CMT. In qualitative research, particularly in studies based on content analysis, the concept of data saturation is used to determine the sample size (Namey et al., 2016). This concept enables researchers to avoid dealing with redundant information. Guest et al. (2016) argued that data saturation is obtained by conducting 6–12 interviews. In our case, we were able to stop the analysis after seven interviews when it became clear to us that no new information, code or topic could be derived from the data obtained. Table 1 contains the demographic profiles of the interview participants.

Table 1: Demographic profile

Name (Pseudo)	Gender	Profession	Age
Sali	M	Master's degree/DMCC student	20–24
Maria	F	Master's degree/DMCC student	20–24
Sanna	F	Master's degree/DMCC student	25–29
Mikka	M	Master's degree/DMCC student	25–29
Max	M	Doctoral student	30–34
Robert	M	Doctoral student	30–34
Meera	F	Master' degree student	25–29

Amid COVID-19 fears, all study participants who were selected for the interview were asked to join the interview online via the Zoom application. After obtaining the necessary consent, the Zoom interviews were recorded and used during the interview

transcription process. The average duration of the interviews was 20 minutes, and they included the same questions that were asked during the learning diary assignment plus one supplemental question: Compared to other case study or teaching methods, how motivated were you in participating in class discussions that involved the V-CMT approach? The inductive data analysis technique was used to analyze the data collected during phases one and two to find patterns and themes. The collected information and observations were analyzed using the content analysis technique.

Data Analysis

Considering the nature of the primary data, including the learning diaries, classroom observations, and the opinions collected during the interviews, we used the bottom-up inductive thematic approach to analyze the data. We followed the six-step thematic analysis process as proposed by Braun and Clarke (2006) and explained below. All the interviews, learning diaries, and notes (observations) were thoroughly examined. Each respondent was given a unique participant identification number. The data were transferred from an MS Word document to an Excel sheet. The themes and associated sub-themes that emerged from reading and rereading the transcripts and diaries were given codes. The codes were then sorted to determine the prevalence of a theme when comparing it to other themes. Finally, names and meanings were also assigned to the themes. In total, five themes were identified: volume and value of learning, engagement, information retention, continuous or future usage of V-CMT, and pitfalls and challenges of using V-CMT.

FINDINGS

Students' Learning

Increasing students' learning experiences is the ultimate goal of every pedagogical approach. Thus, the V-CMT method was developed and deployed to increase our understanding of how much students' understanding of case studies and learning larger frameworks could increase with visual learning. For this specific study, the benefits were measured via two parameters: the volume or quantity of learning and the value or quality of learning. The feedback, which was received via learning tasks and interviews, suggested that V-CMT helped students organize information into quickly comprehensible bulleted lists and tables as well as interactive shapes and schemes. V-CMT also made the learning atmosphere more active and effective; the pictures explaining the cases were considered useful and friendly, and V-CMT was found handy and productive.

"Humans are good at assimilating visual content, and I have noticed that, to me as well, learning visually is [a] good approach. I liked when we discussed and concluded cases in Visio. I think that it was easy to understand the main points of the cases when we did the diagrams together in class. They are clear, and you can see connections between different elements. Besides, learning how to use [the] MS Visio application was highly encouraging and motivating for me (Maria, female, learning task)."

The course participants supported this CMT and found it a good way to learn, especially for those who are more visual learners. Visualization allows students to increase their learning as well as their understanding of cases that are discussed and visually presented in class. Moreover, as described by the course participants, a sufficient amount of information was available on the diagram, which was immediately understandable.

"All in all, I liked the method a lot. It was nice that we discussed the cases in this way because I have not seen anybody else use this kind of study method. [It is] too bad that we did not have time to go through all the original cases because it would have been nice to use Visio even more. Maybe some other time (Meera, female, interview transcript)."
"The purpose of this paper was to give feedback on whether using MS Visio in this course was beneficial from the student's perspective, and I genuinely think it was. I found it very helpful to rehearse the article contents from the diagrams made with MS Visio. Thus, it can be stated that using this method increased my learning and understanding of the cases that were addressed in this course (Mikka, male, learning task)."

Students' Level of Engagement

Contemporary research on learning and teaching in higher education context has focused on how to increase the greater levels of student engagement (Christie & Morris 2021; Heilporn & Lakhal, 2021). Introducing a new teaching method that departs from traditional methods could provide several benefits, including students' increased engagement and class participation. The students' level of engagement with V-CMT was explicitly examined. Some of the course respondents stated that V-CMT summarizes the main points of a case study or article in a reasonable way, which allows anyone using it to rehearse the most important takeaways of the article in a straightforward fashion.

"I like the visualization of the content of the case study with the Visio method. The colors and the forms are used appealingly and directly provide a good overview of the structure/mind map. Additionally, I also liked the usage of icons (e.g., computer symbols, etc.), which kept me engaged as well as helped me understand the overall content (Max, male, interview transcript)."
Most of the students stated that Visio's highly interactive features kept them engaged with the case study and increased their level of participation in class discussion. One student also stated that another benefit of V-CMT is its usefulness and ease, which increased their understanding, comfort, engagement, and interest in CMT.

"It is a great tool that shows complicated tables concerning various aspects. It is useful and easier for students to follow when everything is gone through step by step using the tool and not showing only [a] huge table [that] contains theory for 20–30 mins. It makes things more understandable (Sali, male, learning task)."

"Because V-CMT makes things easy for me, I know what we are talking about, and I can engage at any time since everything is there on a diagram right in front of my eyes. It generates and develops more ideas on the way, and when I see the diagram is being developed so automatically, the brain starts engaging, developing, and building new ideas. I appreciate it myself (Robert, male, interview transcript)."

"It seemed to help with engaging the students because we were participating in creating the content for the class. It is also always a good thing to learn about new technological tools in the context of the class (Sanna, female, interview transcript)."

Students' Information Retention
Considering how much information students can easily digest from a new delivery or teaching method is key to the successful development and implementation of a new pedagogy. Visio offers a variety of options, tools, and customized icons and shapes. These functions could help students quickly understand the case diagram as well as retain the information or content for class quizzes and exams with the help of a single comprehensive diagram. The students were asked explicitly about the role of V-CMT in retaining information or content from the case study. Most agreed that V-CMT helped them retain the primary learning outcomes of a particular case study for a longer duration, which will help them prepare for exams and write thesis projects.

"In V-CMT, we were not simply learning by heart; we were using our heads in analyzing the situation, and that helps a lot in retain[ing] a larger volume of information and later its use during the exam and thesis writing. When it comes to information retention, V-CMT is a very good method (Meera, female, interview transcript)."

Some students stated that it was easy for them to understand and retain the main points of the cases when looking at the diagram in class. They found the diagrams an easy way to study and understand long articles because the diagrams depict all the important points. The following quotations were drawn from the class participants' comments on information retention, especially about the exam:

"Revising the case diagram for the exam was very nice and made my life easier. I do not prefer written exams, which usually require memorizing text, as [is] the case with other courses in my master's degree program. However, the Visio tool was useful because it summarized the main points of the case studies into diagrams. Therefore, it was easy to retain most of the information and possible to get back to the topic by checking only the diagrams when reading the exam (Max, male, interview transcript)."

"I think that it was straightforward to understand the main points of the cases when we did the diagrams together in class. They are very clear, and you can see connections between different elements. And diagrams are also an easy way to retain the information and avoid reading long articles [for] the exam. So, I don't see any negative sides while using Visio (Richard, male, learning task)."

Future Usage of V-CMT
The continuity of the newly developed pedagogy method is the hallmark of its successful implementation and usefulness. In addition to examining the volume and value of learning and student engagement and information retention, future use of V-CMT was also examined and discussed with the participants. The students were asked how useful and productive it would be to prolong and expand the use of V-CMT in other courses, and most recommended its continued use in their class as well as its implementation in other courses/programs.

"First, I thought I [did] not need the visualization because I read all readings completely. Afterwards, I realized that the visualizations are very helpful [for] understanding the overall messages of the papers. Therefore, in my opinion, the usage of Microsoft Vision was a very important part of the lecture. I was able to understand and retain the key learnings so much better. In conclusion, I would highly recommend using Microsoft Visio in future lectures as well (Joe, male, learning task)."

The opinions collected from the students favored the use of new tools in today's online and classroom teaching with the aim of transforming student experiences and learning as well as increasing their digital literacy.

"We are evolving, and so [are] the teaching methods. As a student, I don't find it useful [to] keep the notes of every lecture. We are not robots; we are human beings. V-CMT is a very good and innovative addition to the existing teaching methods, and it should be further refined and used in future semesters as well. [The] combination of visuals and case method teachings is just a perfect combination, which can equally support online and classroom teaching (Maria, female, interview transcript)."

Pitfalls and Challenges
Every teaching method is not proven useful, and not all pedagogies produce the required results. The same logic applies to V-CMT. When the students were invited to share their opinions about the pitfalls they observed and the challenges they faced while working with this teaching method in class, they emphasized a lack of time management, a non-robust preamble, and the absence of prior training on using MS Visio tools as the biggest issues.

"The students should learn how to use the Visio tool themselves first in the class, and then the teacher should start with V-CMT. Although there are various tutorials available on YouTube and other social media channels, it would be very helpful to learn it in the class (Abdul, male, learning task)."

"One of the biggest challenges that I found myself is that since we were required to compress a lot of information in a short time, it is a difficulty when comparing it with other methods [where] we were supposed to write big paragraphs. More time should be given to the V-CMT method (Kailash, male, learning task)."

The study participants also indicated that they were easily distracted by other activities while the teacher was developing the diagram, which left little time for classroom discussion. One-way communication dominated the class during the diagram's development, which highlights the major deficiency in this approach. The teacher should not dominate the discussion; rather, the participants should be trained in using the Visio tools, which will allow them to advise faculty during diagram development. Alternatively, the diagrams should be developed beforehand to allow more time for discussion when reviewing them.

"It could be interesting for you to come up with a finished model/chart before the session, then start from scratch with the students during the class and compare what you did with what the students were offering. It could be interesting to discuss the differences and similarities and spark conversation (Satu, female, interview transcript)."

"In my opinion, a robust preamble explaining the key terms used in the case should be provided, and this will provide a good head-start to the students. Limiting the background information would be very, very critical for the students to understand the context of the study. It would sabotage the V-CMT effort, making it less useful for the students (Mukesh, male, learning task). names and affiliations are to be omitted from original submission."

DISCUSSION AND CONCLUSION

The purpose of V-CMT is visual learning. This article examines the experiences of master's degree university students at an accredited business school in Finland in response to the development and deployment of a new diagram-based CMT. The study used interaction during class, learning tasks submitted by students, and interview transcripts to identify five major themes: students' volume and value of learning, level of engagement, and information retention along with future use possibilities, pitfalls, and challenges.

The results suggested that, unlike the case-teaching method, V-CMT transcended traditional pedagogical approaches and helped the participants increase their volume and value of knowledge, information literacy, engagement, experience, and participation to broaden their understanding of a specific case study. Most participants preferred diagrams, visual stimuli, and schemes (supported with different colors and shapes) over text, which indicated that future teaching methods and pedagogical developments could consider developing diagrams while conducting classroom/online teaching and learning sessions, which aligns with earlier findings reported by King (2016). Diagrams and visual images have widely been recognized as the "most dominant means of communication in contemporary young culture" (Gil-Glazer, 2020, p. 17). Therefore, determining whether a comprehensive diagram could successfully replace text when preparing for exams or writing master thesis projects was a major objective of V-CMT. The students' feedback indicated that this objective was achieved on a large scale, and most students felt comfortable with the diagrams. Their feedback also reflected that they responded well to lecturers who used visual tools (King, 2016).

Future use of V-CMT was primarily supported by the study participants, which suggested its replication in other courses and programs could be positive. Regarding challenges associated with V-CMT, the study should be modified to allow more time for classroom discussion and the development of Visio use skills. This will increase V-CMT usability and functionality and prepare students for the job market due to Visio's broad use and practical implications. The usability of these pedagogical methods could further enhance learning and student interactivity by embedding quizzes into classroom lectures as well as synchronous online lectures. Notably, the usability and the need for more innovative and interactive pedagogical and teaching methods will accelerate given the COVID-19 global pandemic, which has exerted a profound impact on the education sector (Krishnamurthy, 2020).

One of the significant implications of V-CMT is the rich platform offered by Visio, which can easily be integrated into various disciplines, such as management sciences, information sciences, and social sciences, in both the offline and online education contexts. Given the scalability features of V-CMT, this method could be recognized as an alternative teaching method. In addition to the university, vocational, and non-formal education sectors, the industry could also replicate V-CMT when designing and delivering education and training to significantly offset the effects of the COVID-19 pandemic.

Future research may collect more qualitative and quantitative evidence from postulating a future that justifies the need to promote diagrams and a visually based literacy culture at the university, vocational, and professional education levels, including a smart learning ecosystem, to support learner-centred pedagogy (Oyelere et al., 2020). This smart pedagogical trend may also help future research find the answers to critical questions, such as how gamification could benefit education; how animations and simulations could be developed and used as a useful teaching–learning resource; and how virtual reality and artificial intelligence tools and technologies in the classroom and online teaching could be valuable and practical for the student. In addition, without compromising the academic quality and standards of the curriculum, it would be interesting to learn how digitalization might

help academia lessen the novel and unprecedented challenges created by COVID-19 and prepare us for unforeseen pandemics to enable the continuance of learning.

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