Peer Teaching in Vocational Education: A Qualitative Analysis of Student Perceptions of Learning by Teaching

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Abstract: Peer teaching is a learning strategy based on student involvement, whereby students themselves teach fellow students. If properly structured, peer teaching can be a very effective learning technique (Leung et al. 2012).

Peer learning, group work, and other activities that foster peer learning are highly encouraged at the Malta College for Arts, Science and Technology (MCAST). These activities should be structured not only to fulfil the learning outcomes but also to present learners with an opportunity to learn skills and competences that go beyond such outcomes (MCAST 2020). Peer teaching, as a style of learning is most often relatively novel to the students and thus it is of interest to explore the experiences and attitudes of MCAST students with regard to peer teaching.

This qualitative study explores the perceptions of the students when participating in a peer teaching session. In doing so, this research attempts to answer the overarching question of whether the phenomenon of learning by teaching is an effective learning strategy within vocational education.

The research method adopts a constructivist approach as described by Charmaz (2014) and employs a grounded theory methodology that utilizes a conditional matrix as demonstrated by Corbin and Strauss (2015). The methodology made use of interpretative and qualitative in-depth interviews from which the researcher could derive a theory of a process that is grounded in the views of participants (Creswell and Creswell 2018).

A conceptual grounded theory model represents the concepts identified in this research study. A number of factors influence the way in which students engage in peer teaching activities. These include the students’ background and experiences, their attitude towards learning, familiarity with the subject, lecturer preparation, the learning environment and available resources. Students respond to these contextual conditions through a number of actions and reactions, namely by acquiring information through in-depth research, teamwork, presentation of their work to their peers, as well as giving and receiving constructive feedback, while the lecturer acts as a facilitator for learning. As a result, students experience a number of consequences and outcomes which are mainly related to autonomous learning, a deeper learning and improved self-efficacy.

These outcomes present an argument in favour of the implementation of peer teaching as an effective tool in education. Student engagement, collaboration and openness to learning from their peers are key to the success of this method and by incorporating peer teaching into pedagogical practices, lecturers can guide students towards achieving their learning goals while enabling them to acquire skills that facilitate communication with their peers and improve self-efficacy.

Keywords: vocational education; peer teaching; peer learning; grounded theory
Introduction

In education, peer teaching is a learning strategy based on student involvement whereby students themselves teach fellow students. It involves one or more students teaching other students in a particular subject area and builds on the notion by Joseph Joubert that “to teach is to learn twice over” (Whitman 1988). This is because in the process of teaching their peers, students are also learning by teaching. If properly structured, peer teaching can be a very effective learning technique (Leung et al. 2012).

Background to the Research Theme

For many years, classrooms have been centres of teacher-centred learning, where teachers have the most authoritative role in the class and they are the principal sources of knowledge for their students (Setiawan 2016). Rather than initiating a discussion and engaging the students, a number of teachers would be more willing to teach and talk to the students who would in turn listen passively and accept what their teachers tell them (AbdurRachman et al. 2016). This model can result in having students becoming dependent on their teacher, rather than develop a sense of ownership of their learning. Students would not be enthusiastic about finding information by themselves (Exley 2016) and would be unable to manage their own learning processes.

The revolutionary educator Paolo Freire had a strong aversion to the teacher-student dichotomy and suggested that there should be a change in our notions of teacher and student. In fact, he goes so far as to say that:

*Education must begin with the solution of the teacher-student contradiction, by reconciling the poles of the contradiction so that both are simultaneously students and teachers*

*Pedagogy of the Oppressed* (Freire 1972)

The basic roles of participation within the classroom can be thought in terms of the teacher-student and the student-teacher, that is a teacher who learns and a learner who teaches. In this scenario, teachers need to open themselves up to learning through their students. This concept is highlighted in Paolo Freire’s famous quote:

*Whoever teaches learns in the act of teaching, and whoever learns teaches in the act of learning*

*Pedagogy of Freedom* (Freire 1998)

A student-centred approach would allow students to become more autonomous and creative learners (Retnawati et al. 2016). It helps students be responsible for their own learning and improves their higher-order thinking skills as they would be conducting research on particular topics, comprehending and analysing the information, while evaluating and understanding its application. In this scenario, teachers would not be the only source of knowledge but rather their role would be that of facilitators who encourage and guide their students to actively learn by independently seeking information (Duran 2016), and help them when they encounter problems (Topping et al. 2017).

We can identify a number of situations in our daily lives in which we have learned by teaching others. As lecturers, we also have plenty of experiences of having learned something in order to be able to teach it to our students, or occasions where we have learned through helping students to learn.
Peer teaching is commonly used to enhance student learning, while also providing learning benefits for both learners and tutors (Rees et al. 2015). This mode of learning enables students to move away from dependence on teachers and gain more opportunities to enhance their learning. By using this student-centred model and finding out how students would like to learn, we may gain some valuable insights into how the peer teaching method can be utilised.

Research Objectives

This qualitative study sought to explore and understand the experiences, attitudes, and perceptions of health and social care students at MCAST when participating in a peer teaching session. The research project is a qualitative study of students’ perceptions of peer teaching in vocational education, more specifically when learning theoretical healthcare-related subjects, namely about the topic of degenerative diseases.

Different types of degenerative diseases have diverse aetiologies, varying disease processes, as well as different prognoses and life expectancies. Students were given a task that would involve researching a particular degenerative disease, preparing a short presentation and then presenting it to the whole class. During the research and preparation phase students worked in small groups of two or three. They were provided with a common set of questions to guide their research. This team-based learning approach was adopted since it helps reinforce students’ understanding of the course topics. This is because it requires them to revisit the concepts described in their presentation a number of times, in different environments—when they research the topic to gather information for their presentation, when they discuss the presentation with their other group members, and when they teach the topic to the class as a whole.

The study analysed these students’ perceptions and attitudes towards peer teaching and learning. In doing so, this research intended to answer the overarching question of whether the phenomenon of learning by teaching is an effective learning strategy within vocational education.

Literature Review

Students learning from each other was the key component of this research study and thus benefits associated with peer teaching methods were examined. Literature that is associated with pedagogy and student-centred approaches to learning has contributed to the understandings of the effectiveness of these pedagogic practices. The literature map (Figure 1) summarises the relevant sources of information related to the area of study.
Peer Teaching Strategies

In peer teaching, students take on an active role in the learning process and are encouraged to take responsibility for their own learning. The lecturer would work with the students and guide them towards becoming independent learners by providing them with challenges and opportunities to initiate learning experiences rather than simply providing information. The focus is one of developing a more independent approach to learning. A pedagogical approach that encourages student independence in learning would help students develop higher order cognitive processes (Tharp and Gallimore 1991).

Figure 1: Literature Map
As a basic principle of *lernen durch lernen* (learning by teaching), introduced by Jean-Pol Martin in the 1980s, students should assume responsibility of their teaching role and thus students should be encouraged to deliver lessons in an active and communicative way (Grzega and Schöner 2008). In order for students to take a greater responsibility toward learning, they may act as teachers so as to learn through teaching (Davari Torshizi and Bahraman 2019). If this method is to be used as a valuable teaching and learning tool, peer teaching activities should be structured, well-organised, and assessed in order to ensure that the students’ learning experience is optimised. One must not assume that student-centred learning can simply be implemented through presentations. In some cases, students might go through their presentation too quickly, without actually understanding or remembering the content. They would be unaware as to whether their classmates understood the material or not, and they would probably not engage other students and encourage interaction during the presentation (Aslan and Reigeluth 2015). Thus, student collaboration and cooperation is vital for successful implementation of this method, otherwise, the level of learning and skill attainment would be limited.

**Effectiveness of Peer Teaching**

Back in the early 1960s, the National Training Laboratories Institute (USA) developed the “pyramid of learning” (Figure 2). Essentially, this model illustrated how students remember less than 40% when they learn, but they remember up to 90% when they teach other people (Topping et al. 2017). This model, however, has been highly criticised, due to it being unsupported by empirical research (Letrud 2012). Nonetheless, a number of studies have concluded that peer teaching is a learning strategy that is particularly effective and results in higher learning outcomes (Animola and Bello 2019). In addition, a number of studies have also reported that peer taught lessons bring benefits such as improved intrinsic motivation, enhanced learning, and improved communication skills (Grover et al. 2018; Mills et al. 2014; Nshimiyimana and Cartledge 2020).

![Pyramid of learning model developed by the National Training Laboratories Institute (USA)](image)

A study published at Oxford Academic’s ELT Journal in 2017 concluded that the use of peer teaching in the classroom offers a creative way for students to participate more fully in the learning process (Mennim 2017). Peer teaching can enhance learning by enabling learners
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to take responsibility for reviewing, organising, and consolidating existing knowledge and material, understanding its basic structure, filling in the gaps, finding additional meanings, and reformulating knowledge into new conceptual frameworks (Dueck et al. 1993). Through this method, students have the chance to experience and learn that “teaching is the best teacher” (Webb and Farivar 1994).

An important study by Fiorella and Mayer (2013) revealed that by actual teaching of the content of the lessons, learners acquired a deeper and more permanent understanding of the topic. Their findings showed that learning by teaching leads to deeper learning, where learning is more directed toward understanding of the subject in contrast to a surface-level learning where learning happens simply by memorization with the intention of recall. The students are spurred to study the materials in a distinctly different way compared to studying in a normal way (such as for taking tests). In this way, students would gain a deeper understanding of the topic they would have learned about and prepared to teach (Fiorella and Mayer 2013) and the preparation that would be necessary in order to teach a particular topic would require that students thoroughly comprehend the subject matter (Biswas et al. 2005). Furthermore, explaining the materials to other students provided them with a deeper cognitive process resulting in deeper learning (Davari Torshizi and Bahraman 2019).

The benefits to students of this approach are academic, personal, as well as social (Leung et al. 2012). It has been shown that this method of teaching helps enhance interactions between the students and can also be suitable for students of different levels and personalities (McKeachie et al. 2010). Activities associated with peer teaching enhance learning by strengthening the subject knowledge and by allowing the student to conceptualise their understanding of the subject. Engaging with learning materials in an active manner is known to enhance learning, retention, and processing of the information (White 2007).

**Peer Teaching in Medical and Healthcare Education**

Current literature related to medical education suggests that peer teaching enhances the student learning experience by providing useful teaching experiences and enhancing the students’ ability to give and receive feedback (Yu et al. 2011). The concept of peer teaching encourages collaborative and active learning. Through teaching and giving feedback to their peers, the students would be provided with an opportunity to reflect on what they have learned, to ask questions, and to express their thoughts and ideas. Effective reciprocal feedback from peers is a useful formative assessment strategy, creates a culture of teamwork, and can also encourage learner motivation (Asghar 2010).

An overarching goal of education is progressive independence of the learner (Durning and Olle ten Cate 2007). However, students are rarely fully autonomous, and they value pedagogic support and rely on teachers to support their learning process (Dornan et al. 2005). By providing students with interesting and challenging tasks that provide relevant experiences, and by supporting and encouraging students to act autonomously, the students’ motivation to learn would increase (Murdock 1999). Student motivation is an important dimension in students’ learning and it is the students’ involvement and intrinsic motivation that are viewed as prerequisites to meaningful learning (Murdock 1999). A number of studies on small group learning by teaching in medical education have advocated students’ motivation, thorough preparation, active participation, collaboration with other students, good learning style, and good time management as prerequisites for deeper learning (Edmunds and Brown 2010; Spruijt et al. 2013; Tamachi et al. 2018).

In certain situations, nervousness or anxiety is common, and public speaking is no exception. In a number of studies related to healthcare, peer teaching has been documented to cause
However, it has been reported that as more peer teaching activities are established in curricula, learner anxiety decreases (Hundertmark et al. 2019; Mills et al. 2014).

Research Within the Local Context

There seems to be a gap in literature related to peer teaching and learning in medical and healthcare education within the local scenario, with only one study carried out among first-year medical students at the University of Malta (Agius and Stabile 2018).

The Malta College of Arts, Science and Technology (MCAST) is a vocational education institution that caters for post-secondary as well as adult students. The majority of students pursuing courses offered by MCAST are adolescents that are following postsecondary education. A large proportion of teaching activities are typically didactic, with lecturers delivering most of the teaching. However, peer learning, group work and other activities that foster peer learning are highly encouraged at MCAST. These activities should be structured not only to fulfil the learning outcomes but also to present learners with an opportunity to learn skills and competences that go beyond such outcomes (MCAST 2020). Peer teaching, as a style of learning, is most often relatively novel to the students and thus it would be of interest to explore the experiences and attitudes of MCAST students with regard to peer teaching. Such research would help identify ways in which peer teaching can influence student learning.

The following reference book was utilised to help implement peer teaching as a learning strategy within vocational education: Effective Peer Learning. From Principles to Practical Implementation (Topping et al. 2017).

Research Methodology

The overarching qualitative research methodology that is used in this study is grounded theory, where the researcher can derive a theory of a process that is grounded in the views of participants (Creswell and Creswell 2018). The research study seeks to investigate the different ways in which people experience or perceive particular phenomena and the researcher attempts to build the essence of experience from the research participants (Creswell and Creswell 2018). The research process involved in grounded theory is dynamic in nature and can thus offer numerous advantages over more rigid approaches to investigating phenomena (Birks and Mills 2011).

Research Paradigm

The philosophical worldview adopted in this study is a constructivist perspective with an inductive approach that focuses on individual experiences and meanings gathered from open-ended questioning. This is because the goal of this research was to rely as much as possible on the participants’ views of the phenomenon being investigated. This research method adopts the constructivist approach described by (Charmaz 2014) and employs a grounded theory methodology that utilizes a conditional matrix as demonstrated by Corbin and Strauss (2015).

Strauss and Corbin describe the conditional or consequential matrix as “an analytic device to help the analyst keep track of the interplay of conditions/consequences and subsequent actions/interactions and to trace their paths of connectivity” (Corbin and Strauss 2015). The three categories comprising the contextual conditions, actions and reactions, consequences and outcomes, are rooted in Strauss and Corbin’s coding paradigm of the
Conditional and Consequential Matrix (Corbin and Strauss 2015). The matrix enables the researcher to locate an interaction that appears repeatedly in the data and then connect this interaction with the conditions that might influence it.

The research onion (Figure 3) illustrates the different elements involved in this research design. The methodology is based on grounded research and makes use of interpretative and qualitative in-depth interviews. Interpretivist studies are qualitative in nature and the researchers have their own perception and understanding of reality. The phenomenon under study is viewed from the perspective of the research participants rather than from the perspective of the researcher. Analysis of the data would thus result in inductive rather than deductive discoveries (Glaser and Strauss 1967).

In this research study, when interviewing the student participants, they shared their lived experience on a particular aspect of their life. In the grounded theory aspect, the researcher is part of the research tool and should enter the research being theoretically sensitive so that the researcher would be able to interpret the participants’ views. The researcher’s position and values would have an impact on the interpretation of the participants’ views as well as the construction of categories and subcategories that emerge from the analysis of the interviews. Theoretical sensitivity develops throughout the research process as a result of the researcher’s experience, critical insight, and interpretation of information and experiences. Eventually, theoretical saturation will be reached and there would be a clear formation and understanding of the final theory.

Figure 3: Research onion

The process of grounded theory is one through which the researcher forms integrated patterns from the analysis and constant comparison of data, thus leading to the construction of reality that is grounded in data (Glaser and Strauss 1967). The study utilised a mono-method of research whereby qualitative data was collected through in-depth interviews on a cross-sectional time horizon. Each interview was transcribed, coded, and analysed before the subsequent interview was carried out. This enabled a constant comparative analysis whereby incoming data generated from the analysis of subsequent interviews was integrated in the existing analytical framework. Following the systematic collection of data, as well as the comparison and analysis of the qualitative data gathered, theory evolves as a result of concept generation and the continuous interaction between actions.
and concepts (Glaser and Strauss 1967). A logical and structured codified data system was formulated by Corbin and Strauss. In grounded theory, data analysis involves the generation of categories and codes through the continuous comparison of the data and the identification of patterns of data, consequently paving the way for theory building. A diagrammatic representation of conducting grounded theory (Figure 4) illustrates the processes involved in this research design.

In summary, the research process involves a series of systematic steps for collecting data, coding themes, analysis of data, theoretical sampling, memo writing and constant comparison leading to the generation of conceptual categories, subcategories, properties, dimensions, and theory building (Charmaz 2014).

![Diagrammatic representation of conducting grounded theory](image)

**Figure 4:** Diagrammatic representation of conducting grounded theory

This study aimed to reveal the qualitatively different ways in which MCAST students experience the phenomenon of learning by teaching. Thus, a perspective that employs grounded theory methods was appropriate for such a study since the researcher was able to understand the intricacies of how, rather than why peer teaching influences student learning.

**Research Questions**

The following is the main research questions addressed in this study:

> How does a peer teaching approach impact student learning, communication, and feedback skills?
Research objectives:

- To investigate how the students’ learning experiences are influenced through peer teaching and learning.
- To identify pedagogic practices which could influence vocational teaching and learning at MCAST.

Data Collection

The principal method of data collection was through semi-structured in-depth interviews in which the researcher posed a set of key questions together with other spontaneous questions or prompts that emerged during the course of the interview. In addition, memos were created from field notes that resulted from brief comments, ideas, observations and key issues that emerged during the process (Birks and Mills 2011). This memo-writing process enabled the researcher to generate ideas which could be explored at a later stage. It also helped the researcher to maximise the efficiency and effectiveness of the research process (Charmaz 2014).

With the consent of research participants, interviews were digitally recorded, and the transcripts of the interviews were analysed iteratively. The students were interviewed using open-ended questions in relation to their experiences of the phenomenon of learning by teaching and the nature of their classroom engagements with other students. A number of open-ended prepared interview questions allowed the participants to express their views while critically reflecting on their experiences of this phenomenon. The interviews aimed to reveal the students’ learning experiences and their opinion on the use of peer teaching as a learning strategy.

Before interviews were carried out, the interviewees were presented with a participant information letter which outlined the research purpose. Provided they accepted to participate in the study, a signed consent form was requested and therefore, participation was on a voluntary basis through informed consent.

Sampling Strategy

A purposeful sampling strategy was adopted whereby eight participants were selected from a group of students following the course for an Advanced Diploma in Health and Social Care at MCAST. This number allowed for any variation to be revealed but also limited the amount of data that needed to be analysed.

Data Analysis and Interpretation

A qualitative analysis was performed on transcripts of the audio recordings to identify the different ways in which students at MCAST experience the concept of learning by teaching. Data analysis was carried out to identify patterns of data and the software package MAXQDA was used to enhance the coding capabilities that arose from the analysis of the qualitative data collected and to facilitate the identification of common themes—topics, ideas, and patterns of meaning that came up repeatedly. The software helped to evaluate the data, as well as organise the coding system and the written memos, thus enabling the researcher to better recognise the emerging concepts. These concepts were placed within a hierarchical structure comprising a top-down approach that linked categories, subcategories, and properties to each other.

The interview transcripts were first uploaded into MAXQDA and in vivo coding was carried out, whereby important instances from each interview were selected and a label was
assigned to the selection. The in vivo codes reflect assumptions, actions, and imperatives that frame action (Charmaz 2014). Concepts were then created from the codes that arose from the selections of text linked to each in vivo code from each transcript. Memos were used to take notes about the codes and categories that were developed. Through reflexivity, the researcher could gain awareness of the interaction between the researcher’s personal philosophical position and the research participants’ views. This process helps in developing an insight into one’s work as a researcher and could systematically guide future decisions in the research process (Birks and Mills 2011). Reflexivity also offers a means to observe methodological congruence, which can be explained as the accordance between the researcher’s personal philosophical position, the research objectives, and the methodological approach utilised to achieve the research objectives.

Figure 5: MAXQDA screenshot showing the Document System, Document Browser, Code System, and Retrieved segments

An example of MAXQDA used in this research study (Figure 5) shows the four windows: Document System, Document Browser, Code System, and Retrieved Segments. MAXQDA fits within the analysis framework that is essential when a grounded theory study is carried out. The themes that emerged from these concepts were placed into categories and subcategories that were subsequently classified into contextual conditions, actions/reactions and consequences/outcomes, as established in the coding paradigm of the Conditional and Consequential Matrix (Corbin and Strauss 2015).

The contextual conditions are those that arose when implementing peer teaching as a mode of learning and to which situations and conditions students responded through their actions and interactions. As a result, these actions brought about consequences which represent the outcomes of these actions or of responses to events. Therefore, whereas the outcomes are the result of actions in response to the implementation of peer teaching, the consequences answer the questions about what happened as a result of those actions. The different experiences that each student passed through indicate that the contextual conditions trigger the students actions and reactions, which then influence the outcomes and consequences. Consequences may, in turn, trigger variations in the contextual conditions. Additionally, there is the issue of reverse causality where the consequences
would also influence further actions, reactions, outcomes, and context. In fact, authors such as Charmaz (2014) and Corbin (2015) state that all categories will react and interact to explain the phenomenon under study.

The process of data analysis entailed the continuous comparison of data sets and required the researcher to validate the data sets collected. This rigorous process helps to reduce the risk of the researcher influencing the study with any preconceived ideas that would have accumulated throughout one’s professional experiences.

**Qualitative Validity and Reliability in Research**

The validity and reliability of the resultant findings were evaluated by considering Lincoln and Guba’s criteria (Shenton 2004), namely:

- **Credibility** – Ensuring that the resultant findings are in line with the true picture given by the research participants.

- **Transferability** – Using clear descriptions to communicate findings so that readers would be able to see whether they can transfer such findings to other situations (Creswell and Creswell 2018; Shenton 2004).

- **Dependability** – Comprehensively reporting the processes carried out during the research process so that future researchers would be able to repeat the work.

- **Confirmability** – Ensuring that communicated findings are the experiences and ideas brought forward by research participants, rather than those of the researcher.

**Ethical Considerations**

**Confidentiality and Data Protection**

When conducting this research, the General Data Protection Regulation (GDPR) was followed and therefore, the following measures were taken in order to ensure that personal data is kept confidential:

- Confidentiality was maintained throughout the gathering of information. All transcripts were written by the researcher and all responses shared during the study were kept private and not shared with third parties. Any personal data or information that was not relevant to the subject being researched was not collected and, using prompts, the researcher guided the participants to focus on the interview questions whenever re-direction was required.

- Anonymity was ensured since data was presented in an anonymous manner to protect the identities of the students. Each interview was identified only by an alias, such as Interview A, Interview B, etc. Additionally, any background information that might reveal the participants’ identities was omitted. These measures ensured that any data published or released would not allow the participant’s identity to be inferred or disclosed.

- The collected data was securely stored on a password-protected laptop solely used by the researcher. In addition, the laptop was protected with an updated
anti-virus software and a secure operating system to mitigate any risk of data theft and misuse. Data collected throughout the research study was not kept for longer than necessary.

- The participants were invited on a voluntary basis and were able to decline the invitation or withdraw from the study at any point. A full explanation of the research study was given in the form of an information letter which was sent via email to potential participants who were assured complete confidentiality and anonymity.

- Participants were informed that their data would be confidential and that it would neither be available to the college nor influence their grades. This encouraged the participants to express their personal views in an honest and open manner.

- A letter of informed consent was completed and signed by all participants. Due to the qualitative nature of the research study, the interviews were recorded and, therefore, interviews were only held provided that participants gave their consent for the session to be recorded. Any interruptions by third parties were not recorded.

- All findings were reported in an honest and objective manner. In addition, information which might harm the research participants was not disclosed.

**Physical Harm**

Given that the subject being investigated was related to peer teaching, no possibility of physical harm was envisaged. The interviews were also carried out after the lecture, so there was no need for any form of personal protective equipment to protect the researcher or participants from any possible physical harm or accident.

**Moral Harm**

The following precautions were taken to eliminate the possibility of moral harm:

- To ensure that participation in the research study was only through informed consent, participants needed to have a clear understanding of the purpose of the research. Therefore, through the participant information letter, the researcher first explained what the research was about and what would be required of them. Participants who accepted to take part in the research were asked to sign a consent form. In addition, the researcher once again explained the research objectives before the start of every interview.

- Participants were informed that participation in the research study was on a voluntary basis and that they could withdraw from the study at any time, without any negative consequences and without having to provide a reason for their withdrawal. Should a participant have decided to withdraw from the study, the researcher would have deleted all the collected data.
The researcher carried out the research in an honest and transparent manner, without engaging in any deceptive practices by for example making false claims or leading the participants to believe that individual benefits will ensue from the research. Participants were informed that their data would neither be available to the college nor influence their grades. This encouraged the participants to express their personal views in an honest and open manner.

- The researcher was considerate and non-judgemental towards participants, avoiding intrusion and was careful not to ask the participants any questions which cause distress or offence. Therefore, questions of an intimate or sensitive nature were not asked and participants were not asked to speak negatively about their peers, superiors or the college. Furthermore, participants were informed that they were not obliged to answer any questions that made them feel uncomfortable.

- The researcher carried out interviews in a careful manner and sought to establish a rapport with the interviewee to promote the participants’ equal participation in the research process while avoiding power imbalances between the researcher and the research participants (Birks and Mills 2011).

**Business Harm**

The measures taken with regard to the protection of confidential personal data also ensured that any confidential business data would also be protected. Furthermore, in order to remove the possibility of business harm, any names of business organisations such as care homes or healthcare service providers were kept anonymous so as to ensure that their reputation is not tarnished and to prevent business information from being published or released in a form that would allow a business organisation’s identity to be disclosed or inferred.

**Results and Discussion**

This grounded theory research study based on eight students pursuing the Advanced Diploma in Health and Social Care at MCAST provides a framework for identifying the concepts relating to the effectiveness of peer teaching on students’ learning capabilities.

**Evaluation of Emerging Constructs**

The emergent constructs are placed within a hierarchical structure comprising a top-down approach linking categories, subcategories, and properties to each other. Categories are the higher level concepts under which lower level concepts are grouped according to shared properties (Corbin and Strauss 2015). Properties are the characteristics or components of an object or action and are linked to a corresponding subcategory (Charmaz 2014).
Figure 6: Evaluation of the emerging constructs of peer teaching and learning

The hierarchical structure (Figure 6) sets out the constructs that emerged from the analysis of the collected data. It focuses on the impact of peer teaching and learning on students and comprises the categories and subcategories denoting the various constructs relating to peer teaching that emerged from the evaluation of the in-depth interviews with students. The three categories comprising the contextual conditions, actions and reactions, consequences and outcomes, are rooted in Strauss and Corbin’s coding paradigm of the Conditional and Consequential Matrix (Corbin and Strauss 2015).

The contextual conditions are comprised of the factors that influence the way in which students engage in peer teaching activities. These include the students’ background and experiences, their attitude towards learning, familiarity with the subject, lecturer preparation, the learning environment and available resources for healthcare education.
Students respond to these contextual conditions through a number of actions and reactions, namely by acquiring information through in-depth research, teamwork, presentation of their work to their peers, as well as the giving and receiving of constructive feedback, while the lecturer acts as a facilitator for learning. As a result of these actions and reactions, the students experience a number of consequences and outcomes which are mainly related to autonomous learning, deeper learning, and improved self-efficacy.

An evaluation of the interrelationships between these emerging constructs, within the hierarchical structure denoting contextual conditions, actions/reactions and consequences/outcomes, was carried out by integrating structure with process, as advocated by Strauss and Corbin (2008). Structure encompasses the contextual conditions and the consequences, whereas process denotes the actions and reactions undertaken by the students. The contextual conditions trigger the students' actions and reactions, which consequently influence the outcomes and consequences.

The subcategories reflect the construction of reality through the interpretation of grounded data. The three subcategories corresponding to the consequences and outcomes are autonomous learning, deeper learning, and improved self-efficacy. These constructs which are shaded in Figure 6 form the basis towards understanding the dynamic process that impacts the students' learning process as a result of peer teaching. The properties linked to each corresponding subcategory were also analysed. A number of direct quotes from the interview transcripts are included as examples to demonstrate how the data analysis reflected the participants' experiences.

**Autonomous Learning**

**Responsibility for Own Learning**

A shared concept that came up during this study was the students' responsibility for their own learning. Students reported that they benefited from the autonomous preparation required for peer teaching activities.

*It was my first time giving a presentation on a topic that was new to me. I had to do my research before I could teach it to others. I needed to make sure that I fully understood what I was going to present. I couldn’t simply include a figure without understanding what it was representing. It helped that the lecturer was available to help us understand the more difficult concepts.* (Interview A)

The above comment also highlights the fact that despite developing their own strategies for learning and preparing for the presentation, students also benefited from the lecturer's supervision of their peer teaching. This was also noted by other students.

*It is good to teach your colleagues and to learn from them as well, but at our level, we may have something which we don’t understand or perhaps someone doesn’t explain things clearly. So in that case, the lecturer would need to step in and explain it in a way that is easier to understand.* (Interview D)

**Relevance to Personal Experiences**

A number of students wanted to learn about a particular topic because it was related to their personal experiences.

*I was glad about the fact that for my presentation I could choose the topic I wanted to research. My grandfather has just been diagnosed with Parkinson’s Disease so I wanted to learn more about it.* (Interview C)
The topic I chose is one that is very personal to me because I was diagnosed with that disease (neuroblastoma cancer) and I wanted to know more about it. (Interview E)

Interest in Learning

Other students took interest in learning a completely new topic.

I thought it would be interesting to learn about something new so I chose a topic I knew nothing about. (Interview D)

Deeper Learning

Mastery of Academic Content

Research has shown that by teaching their peers, students can further develop their understanding of the material (Fiorella and Mayer 2013; Roscoe 2014) and they can be effective tutors for one another, even with complex and unfamiliar content. The session was designed so that students would gain the theoretical knowledge needed in order to understand the degenerative disease, its process, the aetiology (causes of the disease) as well as life expectancy and prognosis. Such knowledge would be useful if they encounter such diseases in their health care profession. Peer teaching provided students with an opportunity to widen their learning experience by teaching other students. Explaining their research to fellow students helped conceptualise their understanding of the subject.

When it comes to studying, I found that the best way of learning is when you learn and understand something in such a way that you can teach it to others. (Interview F)

Retaining theoretical information is also very important. Participants reported that they felt that they had a better retention of the information because they had engaged in the teaching process.

You delve deeper into the subject when you are researching it yourself. You get to read about the topic on your own, so you need to understand it well in order to be confident enough to deliver the topic in class. Also, when I explain a subject myself I think you remember it more than if the lecturer were to explain it and I was just a listener. Everyone learns something from one another. (Interview C)

Ability to Work Collaboratively

The sessions were designed to enable students to work in groups. The opportunity to work in teams and learn from each other was a common theme identified by the students and they were positive regarding the group-work nature of the peer teaching.

Since we were working in groups of two, we could work together, support each other and provide feedback to each other in order to help improve our work. (Interview C)

It was OK because we were working in small groups so we could practice our presentations and we could give and receive feedback that helped us improve our own work. (Interview A)

Feedback as an Opportunity for Learning

Giving feedback to their peers helped the students to express their views in an honest and constructive way.
When giving feedback I needed to analyse the work of other students and give my feedback in a constructive way. (Interview F)

Receiving feedback from peers helped them to critically review their own work and accept the feedback as a way to improve themselves.

I was worried about my work and that I would speak too fast, but getting the chance to practice the presentation within my group, I found out that the pace was fine and I also had a couple of figures that had been inverted so I could fix that before the final presentation. So I found it really helpful that I could get feedback. When receiving feedback I learnt to accept it rather than be defensive. (Interview E)

I felt quite alright receiving feedback from a friend because I know it’s for my own improvement. It was more relaxed and we could easily understand each other. (Interview C).

**Effective Communication and Presentation Skills**

One other concept that emerged from the students' experiences was how peer learning assisted with developing communication skills and presentation skills.

We learnt how to explain things in a clear and easy way for other students to understand us. And we also learnt how to do presentations online because this was the first time that we are doing presentations that are not in the classroom. (Interview B)

Participants described that they felt more competent as teachers and one student mentioned that she was motivated to be an educator in the future.

I’m thinking about someday going into teaching perhaps. But I need more practice like this since, for the time being, I still feel quite shy in front of a whole class. (Interview B)

**Improved Social Skills**

Students became aware of the importance of giving helpful feedback in an honest, considerate, and sensitive manner. Some students expressed a concern about not wanting to sound negative, so when giving feedback they made sure they also went through the things that other students did well.

I don’t like to criticize and I know the person in my group is quite a sensitive type. So I needed to be careful about wording my feedback if I wanted to comment about something I didn’t like in her presentation. I also made sure I pointed out the good things in her presentation. (Interview C)

There are ways of giving feedback without hurting the other person. When people receive feedback in a respectful way, they are more likely to accept it as a way to improve themselves. (Interview F).

**Improved Self-efficacy**

**Increased Student Motivation**

Participants valued being able to teach, and they reported being motivated in researching the topic well so as to contribute to the learning of their peers.
The fact that I was going to teach the topic motivated me more into researching it properly because you have to understand it well to teach it to others. (Interview A)

I felt more eager and motivated to do the work than if I were only doing it for myself. (Interview D)

I honestly found this very interesting because you are motivated into researching the topic well, especially because you are not forced into it but you choose it. (Interview H)

**Increased Confidence**

Peer teaching in small groups was also reported by some students to boost their confidence when it came to teaching others.

I enjoyed teaching the topic. Having notes and points helped me deliver the presentation well. I think it was a fun way to give out information because rather than listening to a lecturer describe each disease, everyone could research their own topic and learn about other degenerative diseases from the work done by other students. It is a good way to learn. (Interview D)

**Addressing Issues of Self-doubt and Anxiety**

This was the first time that most students had been asked to teach their peers. For many of the students, this prospect created anxiety and fear.

Although we had done presentations previous to this course, we never had to go into such detail and teach the rest of the class. For example, they were presentations where we simply related a story or discussed a book we had read. I enjoyed teaching the topic but it was a little bit stressful because I was worried that I would say something wrong or that other students wouldn’t understand me. (Interview A)

I was constantly doubting whether I had enough information to be able to deliver the presentation well. (Interview H).

Perhaps I wouldn’t know if the presentation I would have prepared would be good enough. (Interview E)

I didn’t mind researching the topic itself but I wasn’t looking forward to presenting it. During presentations I feel anxious and start speaking too fast that it becomes confusing. (Interview B)

Therefore, one important step for the students was that of developing confidence and overcoming this anxiety. Students reported the importance of practicing the presentation in order to perform better, and reduce anxiety.

Having practiced with someone else in my group made me feel more confident about presenting it to a larger group. (Interview B)

Despite participants feeling anxious, some participants reported a strong sense of satisfaction when they were able to overcome their fear and deliver a presentation to
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Their peers. One particular student who suffers from anxiety was given the opportunity of having a discussion with the lecturer and other students about his research topic, rather than presenting the lecture himself from start to finish.

*I suffer from anxiety so it helped that my presentation was more of a discussion with the lecturer because if I were completely on my own I would find myself getting frequently stuck. I think I did quite well and I felt good afterwards. (Interview G)*

*I tend to panic a lot when explaining things to others, so I was not comfortable about the fact that I was going to do the presentation. Yet, at the same time, the subject I chose is something that not many people have heard about, so I was actually looking forward to talking about it so that others would become aware of this disease and learn something new. During my presentation I was blushing, had to take off my jacket and my voice started breaking as though I was going to start crying. However, I’m glad I managed to do it. (Interview E)*

**Issues Related to Peer Teaching**

Besides the positive aspects of peer teaching and learning, a number of issues were also identified, namely the amount of work required for preparation, difficulties between team members, concerns regarding students not providing sufficient or clear information, and a possible disinterest in learning from peers.

*Although it is a good way of learning, it might involve too much work and research if we had to do this for many different subjects. For a few subjects, it could be interesting and useful. (Interview A)*

*There might be issues in collaborating with each other. Also the research done by other students needs to be done right. (Interview C)*

*I think I would have done more work and gone into more detail had I not felt the pressure that I had to explain it. (Interview F)*

*It’s good that we don’t get to listen to a lecture where you hear the same person talking all the time, but at the same time, because I would be listening to another student, I might be tempted to switch off, knowing that I could easily find the information myself. (Interview E)*

**Interpretation of a Grounded Theory Model**

A conceptual grounded theory model (Figure 7) was constructed in an attempt to capture the concepts identified in this research study. The model shows the continuous interactions between context, actions, and outcomes. It demonstrates patterns of interactions that lead to the consequences and outcomes identified in this study.

A pedagogical approach that includes peer teaching would encourage an independent and autonomous way of learning. It would also contribute to deeper learning by increasing knowledge acquisition through in-depth research while also improving communication skills and social skills as a result of collaborative working. These subsequently improve self-efficacy by boosting intrinsic motivation and self-confidence.
**Figure 7:** Grounded theory model for peer teaching

**Practical Propositions**

**Introduce Peer Learning**

Implementing learning by teaching brings about benefits for students as it promotes autonomy and engages them in deep level learning (Davari Torshizi and Bahraman 2019). By incorporating peer teaching into pedagogical practices, lecturers can guide students towards achieving their learning goals while enabling them to acquire skills that facilitate communication with their peers and improve self-efficacy.

**Prepare Students for Constructive Interactions**

During the course of this research project, a number of issues were identified. There was a need for providing appropriate training and instructions for students, prior to the activity. Such training would involve suggestions for teaching the respective topics, as well as training in giving constructive feedback. This could help improve student confidence in teaching their peers.

**Provide Structured Tasks for Peer Teaching**

Peer teaching activities should be structured, well-organised, and assessed in order to ensure that the students’ learning experience is optimised. The lecturer would act as
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a facilitator for learning and would encourage and guide students to actively learn by independently seeking information and help them when they encounter problems. Student collaboration and cooperation is vital for successful implementation of this method, otherwise the level of learning and skill attainment would be limited.

Conclusion

The purpose of this research study was to evaluate peer teaching as a learning strategy in vocational education. Using the grounded theory research process enabled the evaluation of the effectiveness of peer teaching and the influence of this teaching method on skill attainment. This research also offered some interesting insights into students' perceptions of their peer teaching experience.

Answers to Research Question

How does a peer teaching approach impact student learning, communication, and feedback skills?

Collaboration with peers provides a diversity of viewpoints. Furthermore, the development of reciprocal learning relationships is associated with social, emotional and cognitive gains. Student engagement, collaboration, and openness to learning from their peers are key to the success of this method of teaching and learning.

The findings of this study suggest that requiring students to teach their peers is a strong motivator for independent learning. In agreement with these findings, a number of research reports indicate that students perceive that peer teaching provides a worthwhile learning experience in a positive and enabling context (Tien et al. 2002; Topping et al. 2017).

Knowledge gained from this study can contribute towards providing a basis for the adaptation and incorporation of peer teaching and learning into pedagogical practices within vocational education at MCAST.

Critique and Limitations

This research study was carried out to provide a snapshot of peer teaching activities among students in one Health and Social Care class at the Institute of Community Services, over a 4-week timeframe. Further research would be required across other vocational institutes to determine if the findings are consistent and transferable to other vocational courses.

Since the focus of this study was on students' perception, it would be of interest to also research the lecturers' perceptions as well. This is a limitation which could be addressed in future research which could focus on the perceptions of experienced lecturers on the implementation of peer teaching in their classrooms.

Despite being relatively small, this study provided key insights into how peer teaching activities can be evaluated in a systematic way, as well as how this method can influence the students' learning experience.

Final Remarks

Learning is a reciprocal process and by utilising the power of peer teaching, lecturers can guide students towards achieving their learning goals while simultaneously opening themselves to gaining new knowledge. As a pedagogy, peer teaching can significantly
shift the organisation and structure of the lesson away from teacher-centred lectures to situating learning in the act of teaching.

A pedagogical culture that emphasises an active role for students in both teaching and learning is likely to engage them in deep learning. By implementing peer teaching in vocational education, students are encouraged to take an active role which helps them refine their grasp of the learning process and take a deep approach toward learning. Peer teaching encourages students to assume a more active role in knowledge acquisition (Topping et al. 2017; Wadoodi and Crosby 2002). Thus, peer teaching can be a very effective learning technique where students would be learning from being in the teaching role, receiving peer feedback, and reflecting on the experience. The outcomes of this study present an argument in favour of the implementation of peer teaching among students as an effective tool in vocational education. A pedagogical approach that includes peer teaching has the potential to boost intrinsic motivation while increasing knowledge acquisition and improving communication skills. The incorporation of peer teaching and learning into pedagogical practices within vocational education will encourage students to be more assessment literate, take responsibility for their learning and their understanding of the subject, and to acquire skills that facilitate communication with their peers.

Significantly, this research highlights the benefits of learning by teaching. The outcome of this is the possibility that students develop a wider pedagogical perspective particularly due to the teacher-like role they take and its cognitive requirements. Moreover, they experience a reflective process of learning through experiencing a teaching and learning environment simultaneously.

**Interview Questions**

**Introduction:**
- What topic was your presentation about?
- What do you think about being able to choose the topic you wanted to research?

**Preparation:**
- Did you have to learn about the topic before you could teach it?
- How hard was it to create a learning experience for the class?
- How was it working with the other students in your group?
- Did you have a chance to practice your presentation with the other members of your group?

**Teaching:**
- How did you feel about having to teach your classmates?
- What do you think might be the benefits of teaching each other?
- What could be some of the problems with sessions like this?

**Feedback:**
- How did you feel giving feedback to other students?
- How did you feel receiving feedback from other students?

Any other comments?
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