Bittner, Janine

Learning effects from decision-making processes in a project-oriented teaching format. Results from a qualitative study using written reflections

formal überarbeitete Version der Originalveröffentlichung in:
formally revised edition of the original source in:
The 13th European conference on education (ECE2025), July 10-14, 2025. London, United Kingdom, and online. Official conference proceedings. Naka Ward, Nagoya, Aichi : The International Academic Forum (IAFOR) 2025, S. 773-786

Learning Effects From Decision-Making Processes in a Project-Oriented Teaching Format: Results From a Qualitative Study Using Written Reflections

Janine Bittner, Ruhr University Bochum, Germany

The European Conference on Education 2025
Official Conference Proceedings

Abstract

Project-based teaching methods with teamwork components require various coordination and decision-making processes. This qualitative study looks at these processes and the resulting learning effects for the students exemplified by a community-based research service-learning course. In this course, 15 geography students worked together in several project groups for one year. Written answers from the course participants to specific key questions were used as a methodology for the accompanying research and to stimulate the students' reflection. The following main research questions were addressed: RQ 1 What were the different ways of decision-making and consensus-building in the project? RQ 2 What learning outcomes resulted from the decision-making and participation processes? The written responses were analysed using the qualitative content analysis method, following inductive procedures. It became apparent that various forms of decision-making and consensus-building occurred in the project. These included, in particular, the grouping process of the team, selecting the community partners, the research topic and the tasks. The resulting learning effects are manifold. Particularly noteworthy is the insight gained that everyone should have the opportunity to express their opinion, that the individual strengths of each team member are an advantage, that certain framework conditions should be in place for successful communication, that different forms of participation are conceivable and that different views and ideas offer added value. In conclusion, it can be said that project-based teaching formats with integrated teamwork teach practical and social skills that are valuable for students' future professional lives, including decision-making and coordination processes at work.

Keywords: decision-making, learning effect, learning outcome, community-based research, service-learning, written reflection, qualitative content analysis

iafor
The International Academic Forum
www.iafor.org

Introduction

Decision-making processes are a frequent area of importance and research interest in the fields of management science and economics, as well as in various other disciplines, such as psychology and statistics (Andreis, 2020). They serve an essential function in the business context and working life, but also in our everyday lives, in negotiation processes in the interpersonal sphere, with the partner, in the family, in decisions that we make as consumers, in setting priorities in everyday obligations and in leisure time, considerations regarding your own further professional development, the professional career, to name just a few areas. In the entrepreneurial context, strategic decisions play a decisive role. These are entrusted to the company's or organisation's leading managers, often a group of people in the top management (Csaszar, 2012) and thus influence the long-term success of the company and the entire organisation and entail a whole series of further decisions at subordinate levels (Harrison, 1996). Ahmed et al. (2014) pointed out, relating to the importance of decision-making processes, referring to Arsham (2010), that "making the right decisions is not only what someone wants to do, but also includes what he has to do. On the one hand, the repercussions of not making a decision could be more severe than making a wrong decision" (p. 80).

However, what exactly does it mean to make a decision? If a decision is made, a choice is made between different possibilities, which are weighed against each other (Andreis, 2020; Churchman, 1968, as cited in Eilon, 1969; Eisenfuhr, 2011, as cited in Lunenburg, 2010; Massie, 1971, as cited in Omarli, 2017; Etlon, 1969; Ofstadt, 1961; Simon, 1968 all three as cited in Harrison, 1996). Another prerequisite for a decision-making process is that there exist a problem that requires a solution (Andreis, 2020; Corcoran-Perry, 1997, as cited in Omarli, 2017). In addition, it is assumed that a decision is made purposefully, i.e. that a specific goal is to be achieved (Churchmann, 1968, as cited in Eilon, 1969; Harrison, 1995 as cited in Harrison, 1996; Massie, 1971, as cited in Omarli, 2017). Andreis (2020) summarised this as follows:

> (…) For a decision to be taken, there must be at least two alternatives available. The decision-making process, therefore, consists of choosing between alternative actions, to which a result corresponds. We can say, however, that the decision-making process cannot begin until the existence of a given problem is explicitely recognized and resolved. (p. 288)

Several people are usually involved in decision-making processes in a corporate or organisational context. Schwarber (2005) mentioned four reasons why it is important for top managers and team leaders to involve other people, team members in the decision-making processes: information gathering, developing solution options, being able to convince and gaining willingness to take action, as well as passing on decision-making knowledge and skills to others.

Given the great importance of decision-making processes in project-related, complex work contexts in the modern working world and for the long-term corporate or organisational development, it follows that it is important in today's modularised bachelor's and master's degree programmes to confront students with these processes in university courses and to make the decision-making and participation processes visible, name them, and reflect on them. According to Des Marais and Farzanehkia (2000), the transfer of decision-making authority and responsibility for decisions made is an important prerequisite for enabling leadership development in service-learning projects. In professional practice, the tasks of the

project manager or team leader often include moderating decision-making processes within the teams.

The motive behind this research study lies precisely here: to make processes that normally take place unconsciously visible. And to consider this in relation to the learning effect and the students' ability to reflect on it. A review of the literature also revealed that this area requires further research, primarily due to the anticipated benefits for students' preparation for their future professional practice and the limited number of studies in the field.

The sub-study presented in this paper specifically examined the following two research questions:

- What were the different ways of decision-making and consensus-building in the project? (RQ 1)
- What learning outcomes resulted from the decision-making and participation processes? (RQ 2)

At this point, I would like to briefly introduce the course in which the research object presented here was examined and explain why this course was particularly suitable for this purpose. For a more detailed description of the teaching format and the characteristics of the participating students, see Bittner (2025), Bittner and Kempchen (2024a) and Bittner and Kempchen (2024b). It should be emphasised that the newly developed course concept attempts to combine elements of two different teaching approaches: service-learning and community-based research, or research-based teaching and learning.

Service-learning as a specific approach to teaching and learning was described by Bringle and Hatcher (1995) as a:

> Course-based, credit-bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility. (p. 112)

Research-based learning follows the basic idea formulated by Lambert (2009) that "all students benefit from carrying out research" (p. 302). Basically, it can be said that this is an effective educational approach that combines research activities with university or academic learning, making an important contribution to increasing students' research knowledge and their ability to cope with unpredictabiliy and unclear, uncertain situations in science (Wessels et al., 2021), although the scope of the research activities can, of course, vary.

Both approaches share the commonality that students learn through practical experience and reflection on the experience gained, and that holistic development is promoted, which is an advantage in preparing for future careers after graduation. In addition to acquiring specialist knowledge, the acquisition of practical skills, personal development, and social skills also plays an important role.

Table 1 illustrates which elements of the two teaching approaches were included in the course.

Table 1

Characteristics of the Course That can be Assigned to the Teaching Formats Research-Based Teaching and Learning and Service-Learning

Research-Based Teaching and Learning	Service-Learning
▪ collaboration between students in research teams ▪ going through the various phases of the research cycle ▪ development of the research design for a small research study ▪ compilation and analysis of secondary data ▪ applying project management methods ▪ development of data collection instruments ▪ [data collection and analysis]* ▪ preparation of a final report ▪ discussion of the results in a final presentation	▪ collaboration with community partners ▪ addressing issues that are also relevant to the professional practice of employees in the relevant social organisations ▪ applying project management methods ▪ collaboration between students in teams ▪ holistic learning through practical experience ▪ stimulation of reflection processes ▪ appreciative end

Note. * Due to the restrictions imposed by the COVID-19 pandemic and the necessary conversion of the course to a purely online format, the collection and evaluation of primary data could not take place as originally planned.

The course, which lasted for two semesters, addressed the overarching issues of social inequality, poverty, and homelessness. It was organised in collaboration with three social organisations and vulnerable individuals in the case study cities of Bochum and Essen. The students worked on three small research projects, developing research questions that fit into the overarching framework topic. An important component was also working in student teams and learning project management skills in theory and practice.

Compared to other teaching formats, the high proportion of independent, albeit supervised, project work gave students greater freedom and therefore required them to make various decisions. These decisions pertained to the project's further content or specifically to how to address problems that arose. Due to the COVID-19 pandemic outbreak, approximately halfway through the project, the course format was converted to an online format for the remainder of the project. Coordination processes between the members of the individual student teams, and between the course instructor and students, then took place exclusively via digital communication channels. The development of the innovative didactic teaching concept for the course was financially supported by a teaching grant from the Ruhr University Bochum (cf. Ruhr University Bochum, 2020).

Methods

Research Design and Setting

I conducted a qualitative study, utilising written reflections from the students as a data collection method. The participants in the accompanying research study were students enrolled in the community-based research service-learning course during the academic years 2019 and 2020, who completed a written portfolio as a reflection assignment at the end of the course.

Participants

Of the original 16 participants who had chosen the course from various options, 15 students attended until the end and successfully completed the course. Among them were seven male and eight female students, aged between 21 and 27 with a mean value of 22.08. The majority came from North Rhine-Westphalia, where they were born and raised (53%). Two students were foreign-born; the other students were from Germany. The participants in the course, all of whom were advanced bachelor's students in geography, had good basic knowledge of human geography, methods of empirical social research, the application of geographic information systems and statistics relevant to the course.

Data Collection

The data used in this research study were obtained from the students' written reflections. I developed a learning portfolio inspired by the portfolios described by Häcker (2004) for project-based courses with seven reflection-stimulation questions. Reflecting on experiences is also considered an important component of experiential learning approaches (cf. Kolb, 2015). Personally, I found the explanations provided by Hatcher and Bringle (1997) on facilitating and designing reflection activities helpful. They see “reflection as the intentional consideration of an experience in light of particular learning objectives” (Hatcher & Bringle, 1997, p. 153). A portfolio fulfils this function in the form of a question-led written reflection.

The key questions developed in the portfolio related to various topics, including students' ideas about good leadership, successful team project work, risk management, and, in this study, the design of decision-making processes and the resulting learning effects.

One key question in the written reflections related to the qualitative study presented in this paper. It consisted of two sub-questions and was as follows:

- Think in general terms about the possibilities of having a say in the project and decision-making processes. Can you please describe these in more detail? You are also welcome to use examples.
- What have you learned from this?

The students had the opportunity to write their reflections at home or elsewhere, without time pressure, in a relaxed atmosphere. The portfolio was not linked to the final respective examination, which consisted of preparing a research report and a presentation as a team effort and was therefore not graded. The questions in the portfolio were answered by hand in only one case; all other students used a computer to type their thoughts. The handwritten version was converted into a typed version. The students provided answers to the relevant guiding question, which ranged from ¼ to ¾ of a page.

Data Analysis

The qualitative content analysis method, as described by Mayring (2010a, 2010b, 2022a; Mayring & Frenzl, 2019), was employed to analyse the written reflections. The available answers to the key question in the students' written reflections were coded inductively from the text material, which was analysed line by line. The content analysis was carried out using MAXQDA Analytics Pro software, version Release 22.8.0 (cf. Kuckartz, 2010; Rädiker & Kuckartz, 2019), but without the use of AI-supported tools, in accordance with the existing difficulties and limitations in the use of AI-supported data analysis technology, which

Mayring (2025) pointed out. The available text material was searched for concrete statements on possibilities, different forms of decision-making and consensus-building in the project and the resulting learning outcomes. New categories were formed step by step inductively while remaining close to the text. The content analytical units, evaluation unit, coding unit and context unit were defined at the beginning. The clear meaning component was defined as the smallest unit that may be coded, the coding unit. For quality assurance purposes, a second pass of the material was carried out by the same coder after an appropriate time interval. No major changes were made.

Results

The main findings of this research study are presented in the following chapter. The presentation of the results comprises two parts, each corresponding to one of the two research questions examined. Despite the small number of cases analysed, the usual form of result presentation used when conducting a qualitative content analysis, according to Mayring's (2010a, 2010b, 2022a) approach, is adhered to. This also means that the frequencies with which the individual categories occur are indicated. The reference value here is the documents that are analysed. In addition, to make the coding process somewhat more transparent, an example quote is given for each of the categories inductively derived from the analysed text material. It should be noted that the example quotations shown in the three tables may be longer than the actual coded text passage to make the content easier to understand for the reader of this paper.

Different Ways of Decision-Making and Consensus-Building in the Project

Table 2 summarises the key findings of RQ 1, which concerns the different forms of decision-making and consensus-building that occurred during the project work. Nine main categories were formed based on inductive category formation. These are listed in Table 2. The most common occurrences based on case-related frequencies are the three categories: tasks to be completed and to-do's, selecting a research topic and selecting the community partner (each category, 4 out of 10 documents). Looking at the frequencies, the category grouping of the team follows in descending order of category frequency (2 out of 10 documents). Other categories that were only mentioned once are views on the work in the project, choice/selection of the study module, plans to achieve the research objective, structure and content of the final report, problems and questions.

Table 2

Frequencies of Main Categories (Documents With Codes) – Different Ways of Decision-Making and Consensus-Building

	Documents	Percentage	Percentage (valid)
Tasks to be Completed and To-Do's	4	26.7	40.0
Selecting the Research Topic	4	26.7	40.0
Selecting the Community Partner	4	26.7	40.0
Grouping of the Team	2	13.3	20.0
Views on the Work in the Project	1	6.7	10.0
Choice/Selection of the Study Module	1	6.7	10.0
Plans to Achieve the Research Objective	1	6.7	10.0
Structure and Content of the Final Report	1	6.7	10.0
Problems and Questions	1	6.7	10.0
DOCUMENTS with code(s)	10	66.7	100.0
DOCUMENTS without code(s)	5	33.3	-
ANALYSED DOCUMENTS	15	100.0	-

Table 3 presents the categories developed for RQ 1, each illustrated by an example quote from students' written reflections as evidence.

Table 3

Category System with Sample Quotes – Different Ways of Decision-Making and Consensus-Building

- **Tasks to be Completed and To-Do's**
  Sample Quote: "The day was about redistributing the tasks and bringing the members up to date with the latest knowledge. When it came to allocating tasks, I thought it was very good that it wasn't said: "You do this and you do that, ok?" Instead, we were asked which tasks we wanted to take on and which we were confident about." (*Paolo Blümel, male, age: unknown)*
- **Selecting the Research Topic**
  Sample Quote: "Especially in the first semester of the project, for example when we were finding topics, we students were given the opportunity to choose the topics that interested us. As long as the topics matched the overall theme of the study project. We were also always able to contribute our ideas in discussions with the course instructor and then received feedback on which ideas were feasible and which were not. " *(Enno Roskoth, male, age: 21)*
- **Selecting the Community Partner**
  Sample Quote: "We were also able to choose the engagement partners ourselves from those available."(*Nico Gunf, male, age: 24)*
- **Grouping of the Team**
  Sample Quote: "Another decision was made in the choice of team, where each student had the right to choose their team members according to their own interests." (*Carmen Spieß, female, age: 27)*
- **Views on the Work in the Project**
  Sample Quote: "This also applied within the team. Here, views and comments on the work in the project were expressed and discussed." *(Enno Roskoth, male, age: 21)*
- **Choice/Selection of the Study Module**
  Sample Quote: "At the beginning there is the decision to choose the module, which each student has chosen based on individual motivation. This is linked to the participation in the module itself, the conscientious fulfillment of the tasks and requirements. " (*Carmen Spieß*, female, age: 27)
- **Plans to Achieve the Research Objective**
  Sample Quote: "In the team, each member had the opportunity and also the duty to participate in the decision-making process of tasks and plans for the realisation of our research project and goal." *(Alfons Eberth, male, age: 21)*
- **Structure and Content of the Final Report**
  Sample Quote: "The same was applied to decision-making processes, which often concerned the structure and content of the final report."*(Wolfram Wagner, male, age: 21)*
- **Problems and Questions**
  Sample Quote: "These were then evaluated in the next meeting and any problems or questions were dealt with." *(Wolfram Wagner, male, age: 21)*

Learning Outcomes From Decision-Making and Consensus-Building Processes in the Project

The results for RQ 2 will now be presented in this section. The students named a large number of different learning outcomes. The following categories occur several times (unit of analysis: documents): everyone should be able to express their opinion (3 out of 12 documents), importance of communication in the team, individual strengths of the team members are an advantage, dealing with opposing ideas and opininions is seen as positive and pro & con list as an important tool (each category, 2 out of 12 documents). The following categories appeared once: Q & A session is an important tool, brainstorming as an opportunity for participation, processes should be moderated, dealing efficiently with the covered topics, getting to know your interests better, active and passive participation opportunities, decision-making is not a straightforward process, personal involvement increases motivation, a relaxed atmosphere for discussion is important, appreciation of diverse ideas, assignment of tasks according to knowledge and preferences, first decision should lie with the team leader and group size affects decision-making processes.

Tables 4 and 5 illustrate the developed category system. For each category relating to RQ2, an example quote from the written reflections is provided.

Table 4

Category System With Sample Quotes – Learning Effects From Decision-Making and Participation Processes

- **Everyone Should be Able to Express Their Opinion**
  Sample Quote: "A say in the project can only be achieved if all members have a voice."
  (Ludmila Mude, female, age: 21)
- **Importance of Communication in the Team**
  Sample Quote: "This teaches us that communication within a team is extremely important."
  (Maria-Luise Haase, female, age: 22)
- **Individual Strengths of the Team Members are an Advantage**
  Sample Quote: "The individual strengths of each person are particularly helpful in this regard."
  (Wolfram Wagner, male, age: 21)
- **Dealing With Opposing Ideas and Opinions is Seen as Positive**
  Sample Quote: "Since everyone has their own opinion and should be able to express it, it can happen in groups that not everyone agrees. In some cases, it would not be good if everyone had the same opinion. Different opinions allow you to see things in a different light than you did at first."
  (Berta Schleich, female, age: 22)
- **Pro & Con List as an Important Tool**
  Sample Quote: "The pros and cons list is also worth mentioning. In my opinion, it is an important tool for decision-making, alongside gut instinct. There are countless templates available online. They can be very simple or very detailed. The advantage is that they can be implemented quickly. They can also be created as group work in team meetings, giving you a much broader view of the pros and cons of various solutions."
  (Amelie Scheibe, female, age: 21)
- **Q&A Session as an Opportunity for Participation**
  Sample Quote: "Possible ways of participating could include an open Q&A session or brainstorming.This allows each team member to express ideas, wishes, comments, suggestions and problems." *(Ludmila Mude, female, age: 21)*
- **Brainstorming as an Opportunity for Participation**
  Sample Quote: "Possible ways of participating could include an open Q&A session or brainstorming. This allows each team member to express ideas, wishes, comments, suggestions and problems."
  (Ludmila Mude, female, age: 21)
- **Processes Should be Moderated**
  Sample Quote: "A say in the project can only be achieved if all members have a voice. For this reason, one person should moderate these processes." *(Ludmila Mude, female, age: 21)*

- **Dealing Efficiently with the Covered Topics is Important**
  Sample Quote: “and [I] dealt with the topics covered efficiently.” *(Nico Gunf, male, age: 24)*
- **Getting to Know Your Own Interests Better**
  Sample Quote: “Ultimately, we had a great deal of freedom to make decisions and gradually focused more and more on our individual areas of interest. This allowed me to get to know my interests better.”*(Nico Gunf, male, age: 24)*
- **Active and Passive Participation Opportunities**
  Sample Quote: “There are many different ways to have a say in a project and decision-making processes. Members can participate actively and passively.”*(Berta Schleich, female, age: 22)*
- **Decision-Making is not a Straightforward Process**
  Sample Quote: “It can also happen that you make the wrong decision at first and only realise during the course of the project that other decisions might have been better. For example, defining the research question proved more difficult than originally thought. Everyone had different ideas and shared them. We then decided on one idea, but realised during the course of the project that we needed to change the research question due to various changes. This brought the other ideas back to the surface.” *(Berta Schleich, female, age: 22)*
- **Personal Involvement Increases Motivation**
  Sample Quote: “The opportunity to contribute their own ideas made people feel more involved in the project, which also increased motivation.”*(Enno Roskoth, male, age: 21)*

Table 5

Continuation – Category System With Sample Quotes – Learning Effects From Decision-Making and Participation Processes

- **Relaxed Atmosphere for Discussion is Important**
  Sample Quote: “That's why I think it's very important to sit down together in a relaxed atmosphere and give everyone the opportunity to present and explain their views.”
  (Amelie Scheibe, female, age: 21)
- **Appreciation of Diverse Ideas is Important**
  Sample Quote: “In a team, it is common and normal for different ideas and opinions to exist. That is why it is important to acknowledge this first.” *(Carmen Spieß, female, age: 27)*
- **Assignment of Tasks According to Knowledge and Preferences**
  Sample Quote: “If I have understood the question correctly, one example would be the first meeting of the new large team C & D. That day was about redistributing the tasks and bringing the members up to date with the latest knowledge. When it came to allocating tasks, I thought it was very good that they didn't say: “You do this and you do that, ok?”, but asked which tasks we wanted to take on and which we were confident about.” *(Paolo Blümel, male, age: unknown)*
- **First Decision Should Lie With the Team Leader**
  Sample Quote: “Through this type of decision-making, I have learned that it works best in a project team if decisions are first evaluated and weighed up by a team leader, but are still presented to the team and reconsidered if necessary.” *(Alfons Eberth, male, age: 21)*
- **Group Size Influences Decision-Making Processes**
  Sample Quote: “Due to the size of the group, there were difficulties in arranging appointments. Very often, at least one of us was not present and this led to delays in important decision-making processes.” *(Norma Girschner, female, age: 22)*
- **No Concrete Learning Effects can be Named**
  Sample Quote: “Looking back, there were never any problems with decision-making, so I don't think there was much of a learning effect. I can't think of any specific examples.”
  (Hans Jörg Lange-Pölitz, male, age: unknown)

Summary

In summary, the most important results of the study can be summarised as follows:

Based on the available answers in the written reflections, it could be demonstrated that students were able to recognise and describe various decision-making processes that took place during the project work in the community-based research service-learning course. Both

strategic decisions and normal decisions with less far-reaching consequences that had to be made during the project work were listed.

Students' learning outcomes identified from the decision-making processes are diverse, but can be roughly divided into learning effects relating to the design of communication processes, helpful methods that can be used in decision-making and coordination processes in the team, learning effects relating to the general organisation or design of processes that address the duties of the team leader or the responsible manager in particular, the special role of the team leader in the decision-making processes, the general value of individual participation in decision-making and coordination processes, influencing framework conditions and a general view of the decision-making process as a non-straightforward process.

Strengths and Limitations

The study has important limitations which should be named. The number of study participants was small, and although the answers given in the written reflections varied in length, they were shorter in comparison to the answers given in qualitative interviews. This causes problems in two respects.

Both the number of cases and the selection of cases play a role in deriving conclusions that go beyond the actual results obtained from the data, as is often the case in qualitative research. Even if there are differing views on the importance and necessity of generalising the results of qualitative research according to the scientific theoretical position taken (cf. as an overview Mayring, 2007) it should be pointed out that this is usually the aim of content analysis (Mayring, 2022b).

In the context of the accompanying research, the case selection was determined in advance by the necessary focus on the participating students in the community-based research service-learning course, with whom the principal investigator had contact as the responsible lecturer, as well as the university funding received for the course. The number of cases then resulted from the number of students who voluntarily agreed to participate in the accompanying research study. The possibilities of deriving more general conclusions from the study results are therefore limited and should be approached with necessary caution.

The necessary depth of the analysis naturally also depends on the available data material on the individual cases. The use of written reflections as response texts to predefined key questions offers the advantage that students can prepare these independently, undisturbed, and at their own flexible pace. However, there is no direct interaction between the researcher and study participants and therefore no opportunity for the researcher to initiate a longer, more detailed narrative or to clarify ambiguities through more specific follow-up questions, as is the case with qualitative interviews. This leads to limitations in the depth of the analysis.

Conclusion

In summary, the qualitative research study demonstrates that project-based learning formats with integrated teamwork and increased freedom for student work require very different decision-making and consensus-building processes. Students need to make their own decisions, agree on a course of action in a team and agree on the next steps, much more than in conventional instructional learning formats. On the one hand, this places high demands on

the students, but in the protected framework of a university course, they practice self-organisation, clear identification of the problem or the desired goal, communication skills, openness to the views of others, and they take part in moderated processes for consensus and decision-making in a team and have to take responsibility for decisions made and actions taken. The findings also support the conclusion that practising such decision-making processes in a team is highly valuable for students and sets various learning processes in motion, which can be made conscious through stimulated reflection processes. This provides students with advantages for their future professional practice.

Reflections in the present form, as question-driven written assignments, have proven to be a useful tool for encouraging students to engage critically and in-depth with specific topics related to the overarching learning objectives of the course, to review their own experience and to view them from a meta-perspective. In the future, it would be beneficial to incorporate the findings of the empirical study by Hatcher et al. (2004) more closely into the design of experiential learning experiences, as they demonstrate that effective reflections are linked with the classification of a course as a good learning environment. Good reflections are characterised by regularity, structure, and a connection to the students' values (Hatcher et al., 2004). Ideally, reflection should occur at various points throughout the course. In the community-based research service-learning course presented here, this took the form of an oral exchange with the students, but the written reflection based on questions was limited to the end of the course.

It appears valuable to undertake further investigation to explore the different forms of decision-making processes in project-based teaching formats and the resulting learning effects on students. It is recommended to have a larger number of study participants, for example, by extending the study to several courses with a similar structure, the same didactic concept, and the same teaching methods used.

Acknowledgements

I would like to thank my students for their openness in participating in this research study and for their time.

References

Ahmed, A. H., Bwisa, H., Otieno, R. O., & Karanja, K. (2014). Strategic decision making: Process, models, and theories. *Business Management and Strategy*, *5*(1), 78–104. http://41.89.229.23/handle/123456789/1232

Andreis, F. de (2020). A theoretical approach to the effective decision-making process. *Open Journal of Applied Sciences*, *10*(06), 287–304. https://doi.org/10.4236/ojapps.2020.106022

Bittner, J. (2025). Using learning portfolios to investigate students' understanding of positive leadership and their experience with teamwork. *The Korean Conference on Education 2024, Official Conference Proceedings*. https://doi.org/10.22492/issn.2759-7563.2024.45

Bittner, J., & Kempchen, J. (2024a). Exploring students' feelings in the initial phase of a community-based research service-learning course: A qualitative approach using content analysis. *International Journal of Higher Education Pedagogies*, *5*(3), 1–20. https://doi.org/10.33422/ijhep.v5i3.749

Bittner, J., & Kempchen, J. (2024b). Students' characteristics and motives for enrolment in a community-based research service learning project: A qualitative investigation. *Conference Proceedings. The Future of Education 2024*, 552–560. https://conference.pixel-online.net/library_scheda.php?id_abs=6789

Bringle, R. G., & Hatcher, J. A. (1995). A service-learning curriculum for faculty. *Michigan Journal of Community Service-Learning*, 112–122. https://scholarworks.indianapolis.iu.edu/items/450f5213-cc4f-4267-aa79-7ee6e15b1719

Csaszar, F. A. (2012). Strategic decision making. *SSRN Electronic Journal.* Advance online publication. https://doi.org/10.2139/ssrn.2579718

Des Marais, J., & Farzanehkia, F. (2000). Service-learning leadership development for youths. *Special Topics, General*, 65. https://digitalcommons.unomaha.edu/slcestgen/65

Eilon, S. (1969). What is a decision? *Management Science*, *16*(4), B-172-B-189. https://doi.org/10.1287/mnsc.16.4.B172

Häcker, T. (2004). Mit Portfolios in Projekten expansiv lernen [Expansive learning with portfolios in projects]. In D. Krause & P. Eyerer (Eds.). *TheoPrax - Projektarbeit mit Ernstcharakter: Ein Handbuch für die Praxis der Aus- und Weiterbildung in Schule und Hochschule* (2., völlig neu gestaltete und überarb. Aufl., pp. 212–227). Fraunhofer-IRB-Verl. https://www.sstfr.de/eip/media/forum/pdf_13.pdf

Harrison, E. F. (1996). A process perspective on strategic decision making. *Management Decision*, *34*(1), 46–53. https://doi.org/10.1108/00251749610106972

Hatcher, J. A., & Bringle, R. G. (1997). Reflection: Bridging the gap between service and learning. *College Teaching*, *45*(4), 153–158. https://doi.org/10.1080/87567559709596221

Hatcher, J. A., Bringle, R. G., & Muthiah, R. (2004). Designing effective reflection: What matters to service-learning? *Michigan Journal of Community Service Learning*, *11*(1), 38–46. https://eric.ed.gov/?id=ej905169

Kolb, D. A. (2015). *Experiential Learning: Experience as the Source of Learning and Development* (Second edition). Pearson Education Inc.

Kuckartz, U. (2010). *Einführung in die computergestützte Analyse qualitativer Daten [Introduction to computer-assisted analysis of qualitative data]* (3., aktualisierte Aufl.). *Lehrbuch*. VS Verl. für Sozialwiss. https://doi.org/10.1007/978-3-531-92126-6

Lambert, C. (2009). Pedagogies of participation in higher education: A case for research-based learning. *Pedagogy, Culture & Society*, *17*(3), 295–309. https://doi.org/10.1080/14681360903194327

Lunenburg, F. C. (2010). The decision making process. *National Forum of Educational Administration and Supervision Journal*, *27*(4), 1–12.

Mayring, P. (2007). On generalization in qualitatively oriented research. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *8*(3), Article 26. https://doi.org/10.17169/fqs-8.3.291

Mayring, P. (2010a). Qualitative Inhaltsanalyse [Qualitative content analysis]. In G. Mey & K. Mruck (Eds.), *Handbuch Qualitative Forschung in der Psychologie*. (1. Aufl., pp. 601–613). VS Verlag für Sozialwissenschaften (GWV). https://doi.org/10.1007/978-3-531-92052-8_42

Mayring, P. (2010b). *Qualitative Inhaltsanalyse: Grundlagen und Techniken [Qualitative content analysis: Fundamentals and techniques]* (11., aktualisierte und überarb. Aufl.). *Beltz Pädagogik*. Beltz.

Mayring, P. (2022a). *Qualitative content analysis: A step-by-step guide*. SAGE Publications Ltd.

Mayring, P. (2022b). *20. Workshop Qualitative Inhaltsanalyse: 1-3.7.2022, Cap Wörth, Velden am Wörthersee* [*20th workshop on qualitative content analysis: July 1-3, 2022, Cap Wörth, Velden at Lake Wörth]*, Klagenfurt.

Mayring, P. (2025). Qualitative content analysis with ChatGPT: Pitfalls, rough approximations and gross errors. A field report [34 paragraphs]. *Forum Qualitative Sozialforschung / Forum Qualitative Social Research*, 26(1), Art. 4. https://doi.org/10.17169/fqs-26.1.4252

Mayring, P., & Fenzl, T. (2019). Qualitative Inhaltsanalyse [Qualitative content analysis]. In N. Baur & J. Blasius (Eds.), *Handbuch Methoden der Empirischen Sozialforschung* (pp. 633–648). Springer VS. https://doi.org/10.1007/978-3-658-21308-4_42

Omarli, S. (2017). Which factors have an impact on managerial decision-making process? An integrated framework. *Essays in Economics and Business Studies*, 83–93.

Rädiker, S., & Kuckartz, U. (2019). *Analyse qualitativer Daten mit MAXQDA [Analysis of qualitative data with MAXQDA]*. Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-22095-2

Ruhr University Bochum. (2020). Forschendes Lernen [Research-based learning]. https://uni.ruhr-uni-bochum.de/de/forschendes-lernen

Schwarber, P. D. (2005). Leaders and the decision-making process. *Management Decision*, *43*(7/8), 1086–1092. https://doi.org/10.1108/00251740510610099

Wessels, I., Rueß, J., Gess, C., Deicke, W., & Ziegler, M. (2021). Is research-based learning effective? Evidence from a pre–post analysis in the social sciences. *Studies in Higher Education*, *46*(12), 2595–2609. https://doi.org/10.1080/03075079.2020.1739014

Contact email: Janine.Bittner@ruhr-uni-bochum.de