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# Planning, Establishing and Leading a Learning Community for Building MS Power BI Skills in the Case Organization

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## Abstract

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The focus of this study is to plan and implement a learning community aimed at developing Power BI skills among its participants. The case organization is Metropolia University of Applied Sciences, one of Finland's largest universities offering a broad range of educational programs.

The study followed the Applied action research approach. The first step involved reviewing existing knowledge on types of learning communities, their stages of development, successful factors and principles, as well as examining cases of implemented learning communities in companies and higher education institutions. The current state analysis investigated the presence related internal practices within the case organization, as well as the hopes and expectations of potential participants, and the needs and limitations of the organization. In the analysis part, the study revealed a high demand for building Power BI skills among students as 40 participants registered for the learning community. Additionally, it revealed that learning communities are recognized as a desirable direction for development within the case company. The case company hopes that learning communities will allow for a quick response to the demand in competence building in different areas, and wanted to explore the scenario when the learning communities are initiated and led by the students themselves. Additionally, the analysis revealed the stakeholder's expectations for the Power BI Learning community to have a continuous lifecycle.

The outcome of the thesis is an implementation plan for establishing, leading, and developing a learning community, done on the example of the "Learning community of Power BI". This plan was first crafted and then, after launching and conducting the first iteration of the learning community, it was revised and evaluated by the key stakeholders. Thus, the validation stage was done based on the results from the implementation. The impact of the thesis relates to assisting the case organization in establishing its first learning community, led not by staff, but a Master's student.

Keywords Learning Community, Power BI

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## 1 Introduction

In recent years, learning communities have become very popular due to the growth of online learning and the increasing importance of professional development. In line with a growing role of communities, there is an increasing demand for different tools which allows companies and businesses to make fast and effective decisions. Power BI is one of these popular tools where companies want to upskill their workforce. Moreover, learning communities also become popular due to resource constrains in some companies, that often have no immediately available resources for building the necessary skills and competence. Also reviews on internet and YouTube videos indicate that finding a valuable information and resources to learn Power BI, and especially achieve the Microsoft PL-300 certificate, takes time. Despite the strong community and online materials that Microsoft provides, people still like to gather and share their experience and expertise about the tool in a live format.

All of the above factors lead to an assumption that learning communities can be helpful for students at universities by providing them with opportunities to improve their motivation, teamwork, develop their professional and problem-solving skills which are required by lots of employers in various industries. Besides that, such training can give an opportunity to focus on a specific career field.

### 1.1 Business Context

Metropolia University of Applied Sciences is one of the Finland's biggest universities which offers a broad range of educational programs in business, culture, health care, social services, and technology fields. It has the community of more than 17 000 students and 4 campuses: Arabia, Karraportti 2, Myyrmäki, Myllypuro, that are located in the cities of Helsinki, Espoo, and Vantaa. (Metropolia, 2023.)

It is a well-regarded institution which is known for its practical and hands-on approach to education, which prioritizes the development of real-world skills and the integration of theory and practice and has a strong emphasis on entrepreneurship, sustainable development and top-notch, unique expertise in research and innovation activities. (Metropolia, 2023).

Additionally, Metropolia encourages students to take up self-learning as well as achieve different types of certifications which could offer benefits such as career advancement, professional recognition, networking opportunities, skills development. Obtaining a valuable professional certification requires considerable time investment and careful, well-guided preparation. This Thesis takes up a challenge to find the right way to support the students to succeed in such self-learning endeavors.

## 1.2 Business Challenge, Objective and Outcome

The business challenge of this study is to explore one specific non-curricula form of learning to help student develop their skills beyond the curriculum in order to boost their employability as well as provide more varied learning experience when studying at a UAS.

Therefore, the objective of this Thesis is *to plan and implement a Learning community for building MS Power BI skills at the case organization*. It includes starting, developing and leading a real-life learning community towards the intended goals.

The outcome of the Thesis is the plan how to establish and implement a Learning community and the implementation report on the Learning community in MS Power BI skills realized at the case organization.

## 1.3 Thesis Outline

The scope of the Thesis is to plan and implement a learning community for building MS Power BI skills among the participants in the case organization. The research methods for the study include semi-structured interviews, discussions, surveys with the participants, log diary and learning diaries.

The study consists of seven sections. Section 1 is the introduction. Section 2 describes methods, materials, the research approach, research design, data collection and analysis. Section 3 reports a literature review which describes available knowledge on the topics of a learning community concept, the types and methods various learning communities use, and some cases of learning communities' establishments and their practices. Section 4 presents the starting analysis. It contains three parts that cover the participants' expectations and their needs, and the background of the case organization

in relation to the practices of the learning community. Section 5 includes the building of the proposal based on co-creation with the stakeholders in the case organization. Section 6 reports on the results of validation of the initial plan for leading and developing a learning community and its implementation report. Section 7 contains the conclusions and evaluation as for reaching the thesis objectives.

## 2 Method and Material

This section describes the research approach, research design, data collection and analysis methods which are used in this Thesis.

### 2.1 Research Approach

*Research approach* can be presented in different ways depending on the methodology of research. The most common *research families* include pure research vs. applied research, quantitative research vs. qualitative research, and desk study vs. field study. The pure research which also known as basic and applied research have two main types. Basic research involves more theoretical or abstract studies, while applied research is focused on solving practical problems. (Vinod et al., 2017, Types of research.) Field study involves the collection of data on the interactions of individuals or groups within their natural environments through specific processes and methods. Desk research relies on information published in reports and similar documents accessible in open access. Additionally, applied research combines research and development parts which typically relates to continuous enhancement and improvement in organizations (Kananen, 2013, p.20).

Research families also include applying various research methods, with qualitative and quantitative methods representing the most popular division of methods. The qualitative and quantitative research have various paths in collecting and analyzing the data. Quantitative methods include collecting and analyzing numerical data, and the qualitative research is based on gathering and analyzing non-numerical data such as interviews, surveys, observations etc. (Vinod et al., 2017, Quantitative research, Qualitative research).

In this study, the Applied action research is selected as its research approach as it includes a development part. The study relies on using qualitative research methods to find the way how to build a learning community. The methods of data collection for this study include interviews and discussions with participants, surveys, self-observations, internal discussions and interviews with staff and participants, and learning diaries.

## 2.2 Research Design

Research design consists of five sections as presented in Figure 1 below.

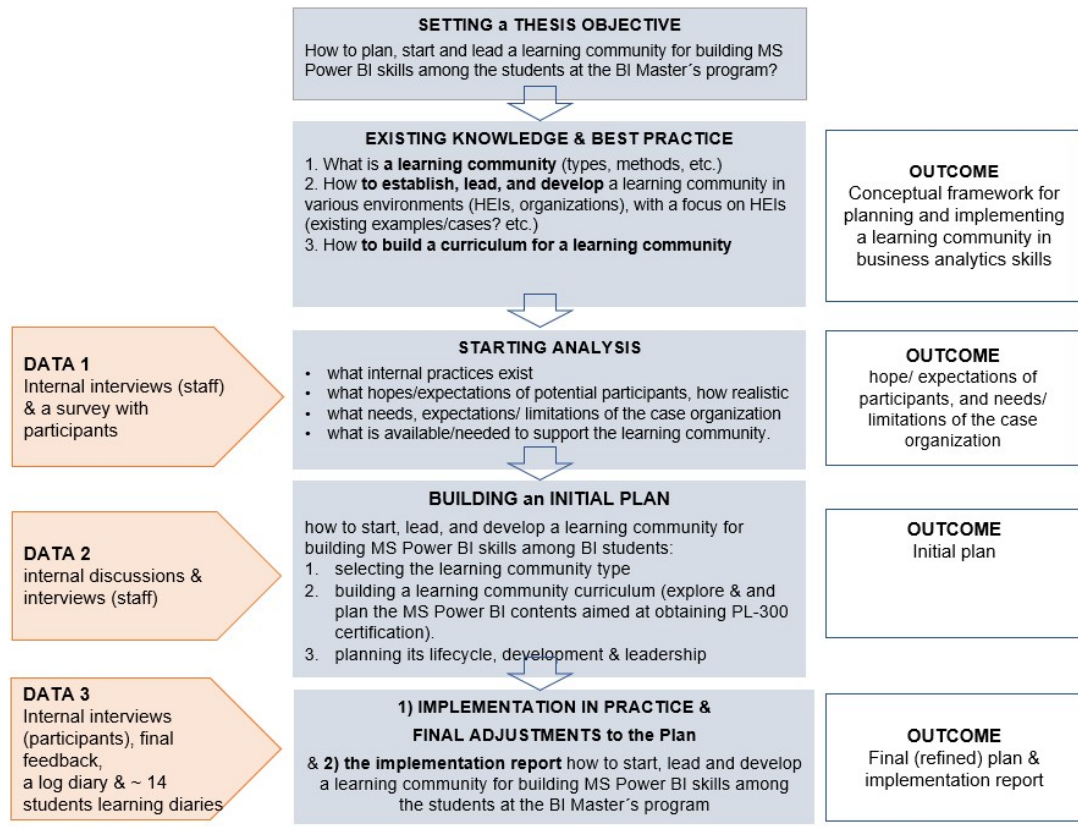


Figure 1. Research design of this thesis.

The Thesis starts with finding the objective of the study which is step 1 of the research design. Step 2 consists of a literature review that explores the existing knowledge and best practices on the topic of establishing and leading a learning community. The aim of this step is to understand what a learning community is, what types of communities exist, real cases and examples of the learning communities. The outcome of the section 2 is the conceptual framework for planning and implementing a learning community.

The next step include data analysis, and consists of a starting analysis that assist to understand the expectations and needs of participants: how realistic their expectations are, what is needed to support the learning community etc. Step 4 consists of a building an initial plan that covers how to start, build, and develop a learning community. The data gathering process on this step consist of the internal discussions and interviews with staff. The last step is implementation and further adjustments to the final plan and

implementation report. It includes internal interviews and discussions with participants, learning diaries, a survey (final feedback) and a log diary. The outcome of Step 5 is a revised implementation plan and final report.

### 2.3 Data Collection and Analysis

This study includes a variety of data sources such as interviews, surveys, internal discussions, log diary and learning diaries. The data gathering process is organised in several rounds as shown in the Table 1 below.

Table 1. Details of Data collections 1-3 used in this study.

	Participants / role	Data type	Topic, description	Date, length	Documented as
<b>Data 1, Current state analysis</b>					
1	Survey with BI students	Questionnaire	What interest/ hopes/ expectation of potential participants	End of May 2023	Written responses
2	Internal interviews (staff)	Face-to-face or Online Interview	Experience and internal practices exist in a case organization	April / 60 - 90 min	Recordings & Field notes
3	Internal discussions (staff)	Face-to-face or Online	What needs, expectations/ limitations of case organization & What is available & needed to support the learning community	April / 60 - 90 min	Recordings & Field notes
<b>Data 2, for Proposal building</b>					
4	Internal discussions (staff)	Discussions	Building an initial plan	May - June 2023	Field notes
<b>Data 3, from Validation</b>					
5	A log diary & ~ 14 students learning diaries)	Notes	Implementation (trial) & further adjustments to the plan	June – July 2023	Field notes
6	Internal interviews (participants)	Face-to-face or Online Interviews	Implementation (trial) & further adjustments to the plan	September – October 2023	Recordings & Field notes
7	Survey with students (Final feedback)	Questionnaire	Implementation (trial) & further adjustments to the plan	September 2023	Written responses

As seen from Table 1, data for this Thesis was gathered in three rounds – for the current state analysis (Data 1), for proposal building (Data 2) and finally for Validation (Data 3).

Data 1 was collected through interviews with internal staff of the case organization to investigate the external practices existing in the organization, as well as the needs and limitations of the case company. Surveys with participants were conducted to understand the hopes and expectations of potential participants and how realistic these expectations are.

In the next round, Data 2 was collected through internal discussions and interviews with stakeholders of the case organization. This phase was organized to identify the methods for leading and developing a learning community based on the participants wishes and expectations and within the boundaries of the organisation.

Data 3 consisted of internal interviews and discussions with participants, their learning diaries, a survey (providing final feedback after the first round of implementation), and a leader's log diary. This data allowed for identifying further adjustments to the initial plan.

In this study, the main methods of data collections were the interviews and surveys. The surveys were conducted through [Elomake.metropolia.fi](https://elomake.metropolia.fi) with the case organization's credentials. Additionally, several interviews were conducted as semi-structured via Zoom with questions created in advance. Some of the interviews were recorded and the field notes taken in an ethical way with advance agreement with the interviewee.

### **3 Existing Knowledge and Best Practice on Establishing, Developing and Leading Learning Communities**

This section discusses various types and concept of learning, their main features and differences between each other. Among the main communities that were studied in this work are Professional Learning Communities, Networked Learning Communities, Communities of Practice, Innovative Knowledge Communities and Social Learning Spaces. This section also discusses the principles, stages of development, factors of successful implementation, supportive conditions of learning communities. The section ends with the conceptual framework how to build, develop and lead a learning community.

#### **3.1 What is a learning community (types, forms, principals, development stages)**

Learning communities have different interpretations depending on the context and purpose they are designed for. This section examines professional learning communities, networked learning communities, community of practice, innovative knowledge communities and social learning spaces.

One of the most common types of communities is a *professional learning community* (PLC) which is a “concept (that) has emerged from a variety of sources”. (Stoll et al., 2006, p.223). The actual term appears in research reviews and foundational works of practitioners (Stoll et al., 2006, p.223), among them are Hord and DuFour. DuFour & DuFour (2011) were both educators who believed in the power of collaboration and continuous learning to improve student achievement. Their definition of PLC is “a never-ending process in which educators commit to working together to ensure higher levels of learning for every student” (DuFour et al., 2016, p. 5.) Hord (2007) emphasizes that “The PLC is not just about collaboration; it is collaborating to learn together about a topic the community deems important”. (Hord & Sommers, 2007, p. 12.)

In addition, “professional learning community suggests that focus is not just on individual teachers’ learning but on (1) professional learning; (2) within the context of a cohesive group; (3) that focuses on collective knowledge, and (4) occurs within an ethic of interpersonal caring that permeates the life of teachers, students and school leaders”. (Stoll et al., 2007, p. 3).

Five main components of PLC, presented by Hord (2007), include:

- 1) Shared beliefs, values, and vision for staff to see their common purpose.
- 2) Shared and supportive leadership or a shared power for making decisions.
- 3) Collective learning and its application – “what community determine to learn and how they will learn it” (Hord & Sommers, 2007, p. 9).
- 4) Supportive conditions or factors that divided on two types: logistical conditions such as time, place, resources etc. and relationships conditions between PLC members, for example, support, openness, respect.
- 5) Shared personal practice or teachers’ review practice, giving, and receiving feedback. (Hord & Sommers, 2007, p. 8-9.)

Hord at al. (2007) propose a map that describes steps to achieve a certain outcome, as shown in Figure 2 below:

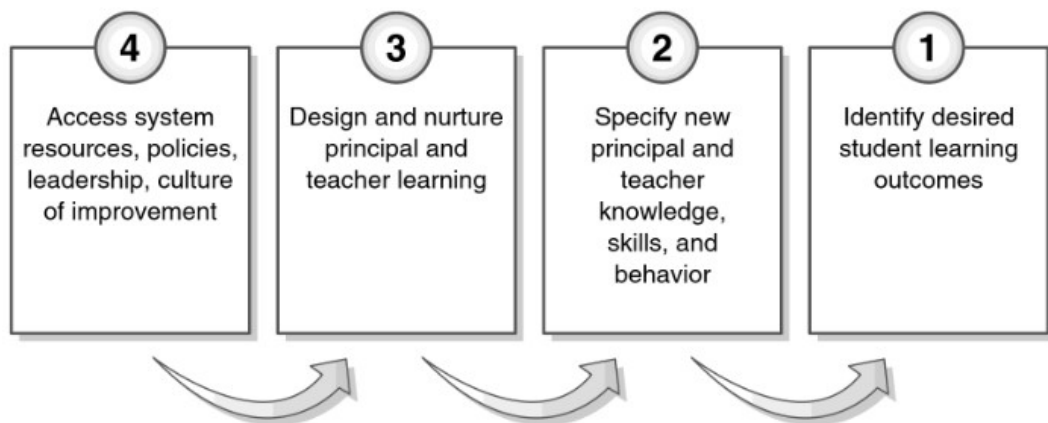


Figure 2. Hord's theory of change (Hord & Sommers, 2007, p. 20).

DuFour & DuFour (2011) also brought up their three main ideas that might help to drive the PLC process. First idea is based on answering four vital questions: 1) What teachers expect from students to learn? 2) How will teachers understand that students are learning? 3) How do teachers intend to handle situations where students don't learn? 4) How teachers respond if some students already are proficient? The second idea is

emphasizing the importance to work collaboratively and work in teams, meet on regular basis, to have clear purpose and priorities etc. The third and last idea is meant to create a result orientation in order to understand if students are learning and how to respond to their needs. In addition, Antinluoma et al. (2021) suggest another set of supportive conditions of PLC based on different studies, and it could be found in its core characteristics, as shown in Table 2 below.

Table 2. Characteristics of Professional Learning Communities (Antinluoma et al., 2021, p. 3).

<b>Characteristics/dimensions/features<sup>a</sup></b>	<b>Research</b>
Shared norms, vision, values, and beliefs	Little and McLaughlin (1993), Kruse et al. (1994); Newmann and Wehlage (1995), DuFour and Eaker (1998); Hord (2004), Bolam et al. (2005), Stoll et al. (2006); Slegers et al. (2013)
Shared and participative leadership	Kruse et al. (1994); Newmann and Wehlage (1995), Hord (2004); Slegers et al. (2013)
Focus on student learning	Kruse et al. (1994); Newmann and Wehlage (1995), Mitchell and Sackney (2000)
Group learning, individual learning; professional growth	Little and McLaughlin (1993), Bolam et al. (2005), Slegers et al. (2013)
Continuous improvement, result orientation	DuFour and Eaker (1998)
Collaborative cultures, collaboration	Little and McLaughlin (1993), Kruse et al. (1994); Newmann and Wehlage (1995), Bolam et al. (2005), Stoll et al. (2006)
Culture of trust, respect, and supportive relationships	Stoll et al. (2006); Slegers et al. (2013)
Collegial relations, inclusive membership	Little and McLaughlin (1993), Stoll et al. (2006)
Mutual support and mutual obligation	Little and McLaughlin (1993)
Reflective practice, reflective dialog, collective inquiry, reflective professional inquiry, derivatized practice	Little and McLaughlin (1993), Kruse et al. (1994); Newmann and Wehlage (1995), DuFour and Eaker (1998), Bolam et al. (2005), Stoll et al. (2006)
Derivatized practice, shared practice	Kruse et al. (1994); Newmann and Wehlage (1995), Hord (2004); Slegers et al. (2013)
Action orientation and experimenting	DuFour and Eaker (1998)

<sup>a</sup>The terms used of the elements varied.

The increased recognition of the possible benefits of using a PLC has made it a widely recognized term among educators around the world. (DuFour & DuFour, 2011, p. 3.) For example, currently, Microsoft offer “Professional Learning Community, PLC (Educator working group)” as a template for creating a team in Teams. It allows to “Connect

regularly with other educators and continue personal career development”, as shown in Figure 3 below.

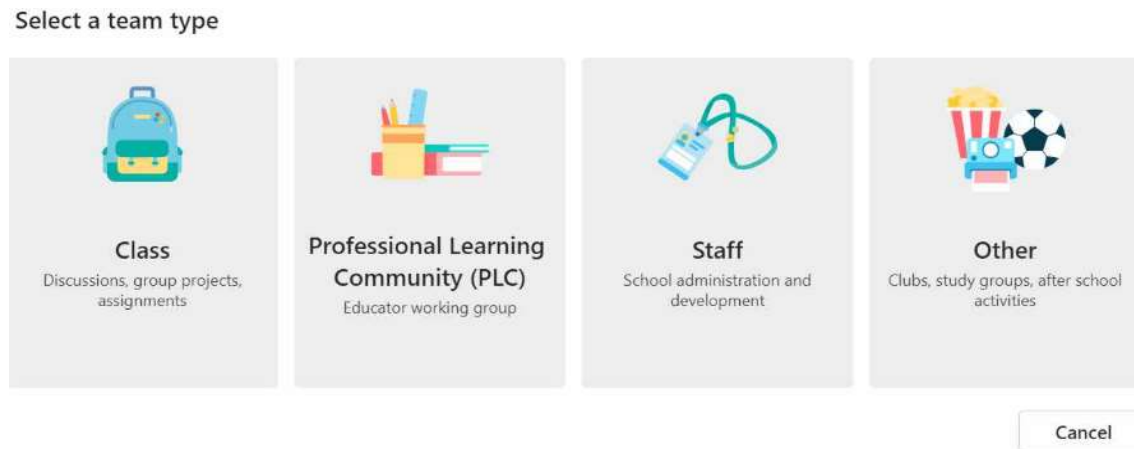


Figure 3. The screenshot of Teams with an opportunity to establish a Professional Learning Community in Teams (MS 2023. Microsoft Teams for Education. Create a PLC team in Microsoft Teams).

Lipponen et al. (2006) has done research on *networked learning communities* (Lipponen et al., 2006, Online teaching in networked learning communities). This form of professional learning community is characterized as a diverse and comprehensive approach to examining the responsibilities and impact of teachers. By networked learning (NL) the authors imply “the use of internet-based information and communication technologies to promote collaborative and co-operative connections”. (Lipponen et al., 2006, Online teaching in networked learning communities). By their research, the authors try to increase understanding of what is happening when participants are involved in networked studying activities.

Another view of NLC is presented by Evert & Cooper Stein (2022). According to them, NLC is a structure of Professional Development that involves educators from different schools collaborating in mutual learning experiences. (Evert & Cooper Stein, 2022, Introduction). However, in their study, by networked learning they mean the learning “through social interactions, communication, and exchange with a network of professional colleagues that extend beyond their local school networks”. (Evert & Cooper Stein, 2022, Networked professional learning communities). “NLCs are one type of professional learning community (PLC), which is a broader concept denoting a group of educators working collectively to improve student learning through adult learning” (Evert & Cooper Stein, 2022, Networked professional learning communities).

Another approach to understanding a learning community is through *the “Community of Practice”*. This theory places emphasis on viewing learning as a social activity that involves active participation and engagement with others. (Wenger, 1998, p. 4.) Wenger (1998) defines communities of practice as the “groups of people who share a concern, a set of problems or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis”. (Wenger, 1998, p. 18; Wenger et al., 2002, p. 4). Learning in this case can be either the reason why the community meets, or it can be an outcome of participants’ interactions. (Wenger-Trayner & Wenger-Trayner, 2015, p.1).

The idea put forward by Wenger suggests that communities of practice exist in various domains, and individuals are likely to participate in multiple communities simultaneously (Wenger, 1998, p. 6). These communities provide an environment for members to exchange and share knowledge, as well as their experiences, with one another. (Agrifoglio, 2015, p.vii).

Community of practice has three unique, crucial characteristics: “a domain of knowledge, which defines a set of issues; a community of people who care about this domain; and the shared practice that they are developing to be effective in their domain” (Wenger et al., 2002, p. 27).

First, *the domain* creates a sense of common identity by affirming its purpose and value to members, specify the topic the community focuses on, it is what gather peoples together and direct their learning (Wenger et al., 2002, p. 27). It is a sphere of knowledge in which participants have a shared interest or expertise (Lancaster, 2020, p. 173), but it is not an abstract area, it consists of key issues that are recognized as important (Wenger et al., 2002, p. 32). Without commitment to a domain, a community is only a group of people because understanding of the domain helps members to decide what matters (Wenger et al., 2002, p. 30).

Second, *the community* creates the social fabric of learning, and it based on mutual respect and trust (Wenger et al., 2002, p. 34). To build a community, members need to cooperate regularly and consistently, engage in activities and discussions, share knowledge, experience, ideas and learn together. Community is a “vital element because learning is a matter of belonging as well as intellectual process” (Wenger et al., 2002, p. 29).

Third, *the practice* is a concrete, particular knowledge, skills the community develops, shares, and maintains. It is a set of frameworks, ideas, tools, information, documents etc. that community participants share. It allows the community to proceed effectively in dealing with the domain. (Wenger et al., 2002, p. 29.) Members of a community of practice are practitioners (Wenger-Trayner & Wenger-Trayner, 2015, p.2).

Wenger et al. (2002), to make it clear how COPs are different from other structures, provides some alternatives to this concept, which is shown below on Table 3.

Table 3. Distinctions between communities of practice and other structures (Wenger et al., 2002, p. 42).

	What's the purpose?	Who belongs?	How clear are the boundaries?	What holds them together?	How long do they last?
Communities of practice	To create, expand, and exchange knowledge, and to develop individual capabilities	Self-selection based on expertise or passion for a topic	Fuzzy	Passion, commitment, and identification with the group and its expertise	Evolve and end organically (last as long as there is relevance to the topic and value and interest in learning together)
Formal departments	To deliver a product or service	Everyone who reports to the group's manager	Clear	Job requirements and common goals	Intended to be permanent (but last until the next reorganization)
Operational teams	To take care of an ongoing operation or process	Membership assigned by management	Clear	Shared responsibility for the operation	Intended to be ongoing (but last as long as the operation is needed)
Project teams	To accomplish a specified task	People who have a direct role in accomplishing the task	Clear	The project's goals and milestones	Predetermined ending (when the project has been completed)
Community of interest	To be informed	Whoever is interested	Fuzzy	Access to information and sense of like-mindedness	Evolve and end organically
Informal networks	To receive and pass on information, to know who is who	Friends and business acquaintances, friends of friends	Undefined	Mutual need and relationships	Never really start or end (exist as long as people keep in touch or remember each other)

Wenger's theory became very popular and had a huge impact in different fields that prompted other authors to propose various theories based on CoPs. For example, Hakkarainen et al. (2004) examine the concept of communities of practices and how it may expand toward *innovative knowledge communities* (IKCs). Their analysis draws upon three models of IKC: "Nonaka & Takeuchi's model of knowledge-creating companies, Engeström's expansive learning models, and Bereiter's knowledge-building approach". (Hakkarainen, K., 2004, p. 5.) These models complement each other and have the same focus or dogma on developing new knowledge or practice. IKCs has lots of common with the CoPs but still there are some key differences between them:

- 1) The CoPs are mostly function in predictable and stable environments while IKC operating in conditions of dynamical changes and progress (Hakkarainen, K., 2004, p. 7).
- 2) IKC has focus on developing new knowledge, practices and innovations based on earlier achievements (Hakkarainen, K., 2004, p. 6) while CoP has a "limit innovation" (Wenger et al., 2002, p. 139).
- 3) IKCs does not have a very strong hierarchical structure like at Cops. IKC based on solving problems which nobody solves before so newcomers can have relevant expertise or knowledge to solve a certain issue (Hakkarainen, K., 2004, p. 6).
- 4) One of the main tasks of CoPs is finding localized solutions for a practical dilemma while IKC is intension to a progressive problem solving (Hakkarainen, K., 2004, p. 6).

Despite these differences, the authors pay attention that the line between CoP and IKC might be very thin and sometimes strong distinctions are not possible (Hakkarainen, K., 2004, p. 8).

Later, another concept of *social learning spaces* was introduced by Wenger-Trayner and Wenger-Trayner (2020). The framework they proposed was born out of the work on communities of practice (Wenger-Trayner & Wenger-Trayner, 2020). They explain the necessity of the new concept in practical and theoretical ways. Practically, the theory of learning spaces is "applicable to a broader spectrum of social learning circumstances

than strictly communities of practice”. Theoretically, they emphasize that the concept of COP supposed to be use in two modes: 1) repertoire of practice and a regime of competence 2) learning interaction or partnership. The authors admit that this distinction was not clear in their previous works. Thus, the authors’ intention is to split two sides of concept of CoP and “keep the notion of community of practice to refer on ongoing learning partnership, which over time has resulted in a shared practice and a regime of competence”. For the mode of mutual engagement (that is more common to call a *community of practice* nowadays), they use the concept of *social learning space*. (Wenger-Trayner & Wenger-Trayner, 2020, p. 31-32.) Thus, three terms contribute to the concept of social learning space:

- 1) Social in the sense of social relationships or interactions among the people.
- 2) Learning in the sense of cooperative engagement.
- 3) Space in sense of an area where learning can take place or a shared location. (Wenger-Trayner & Wenger-Trayner, 2020, p. 13.)

According to Wenger-Trayner & Wenger-Trayner (2020), a space calls the social learning space if it is generated by three main characteristics:

- 1) Caring to make a difference – participants see it as chance to change the world or themselves.
- 2) “Engaging uncertainty is a state of strain between caring to make a difference and seeing the next steps” (Wenger-Trayner & Wenger-Trayner, 2020, p. 15).
- 3) Paying attention “is not the same as taking feedback at face value. It is an active dance between accepting, taking in, thinking about, resisting, and refusing feedback” (Wenger-Trayner & Wenger-Trayner, 2020, p. 15).

Despite different concepts, learning communities can take different forms. Etienne Wenger is one of the first who offer a classification of the forms of CoP. He classifies communities on “small/big, short-lived / long-lived, co-located / distributed, homogeneous / heterogeneous, inside boundaries / across boundaries, spontaneous / intentional, and unrecognized / institutionalized”. (Wenger et al., 2002, p. 24.)

There are also some more contributors who have tried to investigate the typologies of CoP. Among them are Gongla & Rizzuto (2001), Dubé et al. (2006), McDermott (2000) and others. Agrifoglio (2015) identifies nine significant structural features from these studies and categorized them into four groups: demographic, organizational, individual, and technological. Table 4 below shows this classification.

Table 4. Forms of communities of practices (Agrifoglio, 2015, p. 32).

Categories	Features	Forms of community of practice
Demographic	Age	Young/old
	Size	Small/big
	Lifespan	Short-lived/long-lived
Organizational	Creation process	Spontaneous/intentional
	Organizational boundaries	Inside boundaries/across boundaries
	Degree of formalization	Unrecognized/institutionalized
Individual	Proximity	Co-located/distributed
	Background	Homogeneous/heterogeneous
Technological	Degree of reliance on ICT	Face-to-face/virtual

It is believed that CoP “has had a huge impact in the fields of management, organizations and what is known as Human Resource Management” (Hughes et al., 2007, p. 2).

Table 5 summarizes the types of the learning communities described above, and their concepts and main features, also referring to the names who proposed it.

Table 5. Summary of learning communities' concepts.

Type	Key features	Key names
Professional learning community	"1) Shared beliefs, values, and vision 2) Shared and supportive leadership 3) Collective learning and its application 4) Supportive conditions 5) Shared personal practice" (Hord & Sommers, 2007, p. 9)	DuFour & DuFour (2011), Hord & Sommers (2007), Stoll, Bolam, McMahon, Wallace & Thomas S. (2006)
Communities of Practice	1) "Domain of knowledge 2) Community 3) Practice" (Wenger et al., 2002, p. 27)	Wenger, (1998), Wenger, McDermott & M. Snyder (2002)
Innovative knowledge communities	Focus on developing new knowledge, practices and innovations based on earlier achievements	Hakkarainen, Paavola, & Lipponen (2004)
Social learning spaces	1) Social 2) Learning 3) Space	Wenger-Trayner & Wenger-Trayner (2020)

In summary, it is possible to distinguish four main concept of learning communities: *professional learning communities*, *communities of practice*, *innovative knowledge communities* and *social learning spaces*. It is important to highlight that during this overview, the focus was on professional learning so such communities as communities of interest (like books club, or movies clubs) have not been considered.

First, *Professional learning communities* were selected as the focus due their importance in educational progress in order to promote students' success and achievements. So, such learning community forms as PLC allow teachers, educators to gather and find the ways of educational improvement through shared values, supportive leadership and conditions, collective learning with feedback.

Second, *Communities of practice* is another concept that is based on three main principal elements. These are domain of knowledge, community of people and shared practice. CoP is a group of people who spend time together to develop and exchange knowledge and who shared interest and practice.

Third, the concept of *Innovation knowledge community* relies on the same shared goals and practices as CoP but the main difference is that IKC has focus on production new

knowledge, innovations and progress based on previous achievements rather than just exchanging knowledge between participants.

Finally, *Social learning spaces* is an event with three main factors: 1) caring to make difference 2) engaging uncertainty 3) paying attention. The social learning spaces is not supposed to be intentional and do not expect all participants have the same background, interests, or goal. The social learning spaces can take different types of form from competitive to conflictual and takes in different formats such as online or classroom. A social learning space may become a community of practice if it begins to establish a regime of competence.

Thus, the main types of learning communities include: *Professional Learning Communities, Communities of Practice, Social Learning Spaces, and Innovative Knowledge Communities*. The next section focuses on the establishment, leadership, and development of learning communities.

### **3.2 How to establish, lead and develop a learning community in various environments, with a focus on HEIs**

This section explores literature and existing cases to identify common issues and milestones associated with establishing, leading and maintaining communities of practice in various environments. This can help reveal best practices and strategies for overcoming challenges, questions, maximizing the benefits of CoPs in university contexts.

#### **3.2.1 How to establish, lead and develop a learning community**

There are various approaches to the establishment, leadership, and development of learning communities. One of the most noticeable approaches is the stages of development proposed by Wenger et al. (2022), which describe the potential phases that a community can go through. Wenger's (2002) seven principles are helpful for designing the community with direction and character. These principles can be complemented by Borzillo's (2007) five key factors for a successful community. Lancaster's (2020) seven Cs keys provide additional structure and support. Finally, Conole's (2017) learning framework consists of seven key stages involved in building learning design.

Each community has a certain life cycle or development cycle. Based on Wenger's theory (1998), CoPs can have five stages of development which are shown below on Figure 4.

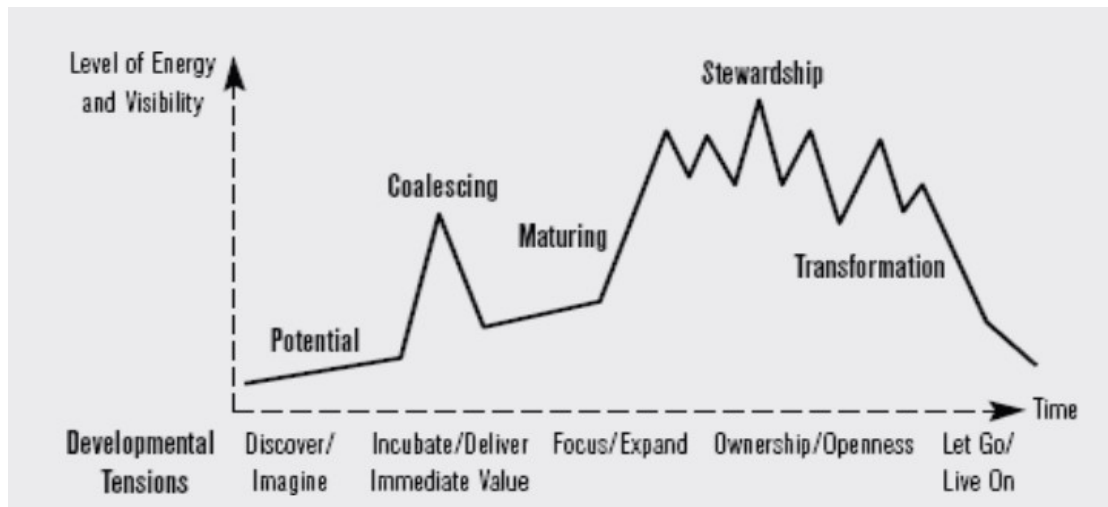


Figure 4. Stages of community development (Wenger et al., 2002, p. 69).

According to Wenger et al. (2002), the CoPs development is rarely smooth as anything else in life. These five stages are aimed to describe challenges that community might face during its establishment and progress. The *potential* stage includes two main steps:

- 1) Discovering and imagining what you would like to build and where it can lead.
- 2) Planning communities where you determine the domain and the primary intentions of the community, identify issues, finding a focus, interview potential participants, connecting community members, creating ideas how the community might work. (Wenger et al., 2002, p. 72).

During the *coalescing* stage, the community is hosting events and holding activities. On this stage is very important to generate energy to make community thrive and take some time on building trust, share knowledge between participants. The coalescing stage has next steps:

- 1) Cultivate and deliver value.

- 2) Nurture the community, which includes building benefits of contributing and the value of learning; launching the community and moving it through; initiating events and activities; building connections between group participants, finding the ideas, insights that are worth sharing; documenting to deal with overlapping and disorganization; finding the opportunities to provide value; engaging communities members. (Wenger et al., 2002, p. 85).

The *maturing* stage has:

- 1) Focus and Expand
- 2) Maturing that identifies gaps in knowledge, defining the community's role in an organization, redefine community's boundaries, regularize processes for newcomers, measure the value, organize the knowledge's storage. (Wenger et al., 2002, p. 98).

At the *stewardship* stage, the tension is continuing to grow so the goal of community is to balance "its sense of ownership with receptivity to new people and ideas" (Wenger et al., 2002, p. 105). On this stage, the key need is to rejuvenate the community, actively finding new participants and mentor them, develop new leadership, use ideas from the others organizations.

The *transformation* stage or the end of a community is a logical thing to happen. Some communities just disappear, some are turning into social club, and some might transform into centers (Wenger et al., 2002, p. 110).

To design the community of practice with directions, character and structure, Wenger at al. (2002) suggest seven principles based on their practical experience: 1) Design for evolution as it has the main key to combine design elements in a way that activate community development. 2) Open dialogue between inside and outside perspectives that brings information together regarding what the community can achieve. 3) Different levels of participants: core group, active, peripheral and outsider. 4) Development of public and private community spaces such as meetings, web sites or other platforms, one-to-one networking etc. 5) Focus on value and creation of events, activities that would help the potential value emerge and discover ways how to harvest it. 6) "Combine

familiarity and excitement”. (Wenger et al., 2002, p. 49.) 7) “Create a rhythm for the community”. (Wenger et al., 2002, p. 49.)

In addition to these principles, Borzillo (2007) brought together the six main factors of success from different studies that could help with COPs establishment. Figure 5 shows them below.



Figure 5. Factors to successfully manage CoPs (Borzillo, 2007, p. 54).

Clear objectives should help explain the community’s value and thus to attract participants. The sponsorship can be made by investing sources such as time and financial resources. The leadership is the most critical factor of CoP success as leaders takes most of responsibilities of CoP effectiveness. By routinization, Wenger means the “rhythm of community” (2002) and includes different types of events, such as meetings, webinars, workshops etc. The environment needs to be risk-free as a necessity to keep interactions within community productive. The last one factor is result which is means the outcome for an organization, community, and participants. (Borzillo, 2007, p. 60.)

However, Borzillo's factors for successfully managing the learning community are not the only approach to consider for its establishment. For example, Lancaster (2020) proposes seven Cs keys that might help building successful community. It is cause, culture, conditions, cadence, content, contribution, and credit which are represented on Figure

6. “Communities don’t just work they require some structure and support” (Lancaster, 2020, p.193).

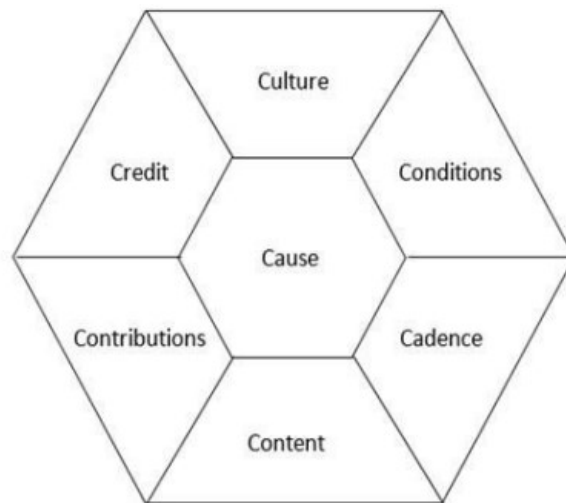


Figure 6. The Lancaster’s Cs model of successful learning community (Lancaster, 2020, p.183).

In Figure 6, *the cause* or Wenger’s domain is a reason of existence, a main purpose of the community that will drive engagement with focus in delivering outcomes (Lancaster, 2020, p.182).

*The culture* is the key to build a healthy environment as all relationships including communities are not always harmonious, they involve challenges and disagreements. So, it is vital to establish some certain values or model of interaction to maintain stability and well-being for the community participants. (Lancaster, 2020, p.184.)

*The conditions* are a design of the environment which includes collaboration, access, communication, sharing etc. For online communities it could be a platform of Facebook, LinkedIn, or something similar. For face-to-face learning communities, it will be an advantage to hold the meetings in a nice-designed place for inspiration. As an example, Lancaster (2020) was having his team meetings in museums, galleries as he thought that it would bring more energy than the office can sometimes deliver. Another thing to make conditions better is supporting collaboration that could be provided by someone who will coordinate and serve activities. (Lancaster, 2020, p.185.)

*The cadence* or rhythm of interactions is needed to prevent a community from stagnation, it is important to have a regular flow of activities to encourage people to engage. (Lancaster, 2020, p.186.)

*The content* is the key to improving practice, having discussions, sharing experience etc. (Lancaster, 2020, p.187.)

*The contribution* is also an important key of community success. To get a high proportion of members who contribute is a goal to attain. To maximize engagement in a community to make sure that all group doesn't depend on a few people. For solving this problem Lancaster (2020) suggests Bryce Williams' principle of "working out loud" that had been enhanced by John Stepper. (Lancaster, 2020, p.187). The idea of the principal is making your work visible using five elements:

- 1) Make your work visible.
- 2) Make your work better – to improve it through feedback.
- 3) Generously lead, share contribution.
- 4) Build a network.
- 5) Make deadlines and purpose. (Lancaster, 2020, p.187.)

The last Cs is *the credit* or recognition that motivates a community. Giving credit to participants such as recognizing someone's progress or public thanks could help a community succeed. (Lancaster, 2020, p.189.)

By Lancaster (2020) the communities are the most effective with these given elements. Despite on that, there is another learning framework was proposed by Conole (2014). It has another seven Cs which are displayed in Figure 7.

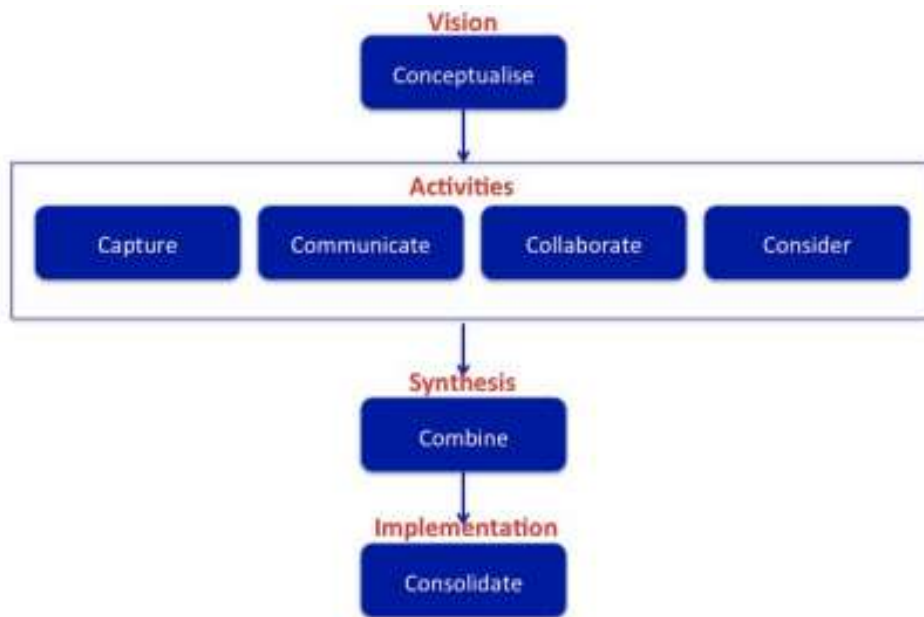


Figure 7. The Conole's learning framework design (Conole, 2014, p.504).

The 7 Cs, shown in Figure 7, illustrate the main key stages involved in building learning design:

1. Conceptualize should help to find the vision, essence and for who it all designed for.
2. Capture stage should answer the question: what resources will be needed?
3. Create stage defines the learning activities and learners' engagement.
4. Communicate stage covers the types of communication between the members.
5. Collaboration covers types of collaboration the learners will be using.
6. Consider stage covers the reflection's forms and learning outcomes.
7. Consolidate is helping to understand if the learning design effective and if all working together properly. (Conole, 2014, p.504.)

Table 6 summarizes the existence knowledge regarding CoP development.

Table 6. Summary of Lifecycles of Community of Practice type of a learning community.

Name	Characteristics	Author(s)
Five stages of development	1) "Potential 2) Coalescing 3) Maturing 4) Stewardship 5) Transformation" (Wenger et al., 2002, p. 69)	Wenger et al. (2002)
Seven Principals	1) "Design for evolution 2) Open a dialogue between inside and outside perspectives 3) Invite different levels of participation 4) Develop public and private community spaces 6) Focus on value, combine familiarity and excitement 7) Create a rhythm for the community" (Wenger et al., 2002, p. 49)	Wenger et al. (2002)
Seven Cs - Factors of success	1) Cause 2) Culture 3) Conditions 4) Cadence 5) Content 6) Contribution 7) Credit (Lancaster 2020, p.183)	Lancaster (2020)
Factors of success	1)Objectives 2)Sponsorship 3)Leadership 4)Routinization 5)Environment 6)Results	Borzillo (2007)
Seven Cs - Stages of learning framework	1) "Conceptualize 2) Capture 3) Create 4) Communicate 5) Collaboration 6) Consider 7) Consolidate" (Conole, 2014, p.504)	Conole (2014)

As summarized in Table 6, the community of practice can go through five main stages of its life cycle, as generalized by (Wegner at al. 2002): potential, coalescing, maturing, stewardship, transformation. There are seven principles of its building: "design for evolution, open a dialogue between perspectives, invite different levels of participation, develop public and private community spaces, focus on value, combine familiarity and excitement" and the last one is creating a rhythm for the community. (Wenger et al., 2002, p. 49.) The factors proposed by Lancaster (2020) complement Wenger's principles. Conole's stages of learning framework is also worth attention. Among the six success factors gathered by Borzilo, one, in particular, stands out – leadership.

*Leadership* makes a separate topic when discussing learning communities. As was mentioned already in relation to Borzillo's (2007) and Wenger's (2002) works, the effectiveness of a community's leadership plays a vital role in determining the community's success. The "health" of Communities of Practice relies on active volunteer *member's participation* and the emergence of *internal leadership*.

Borzillo (2007) pulls together all the main characteristics of a successful leader from different sources. For instance, according to Wenger et al. (2002), leaders typically *allocate* a significant portion of their *working time*, ranging from 20% to 50%, to promote and oversee activities within the Community of Practice. Leaders are responsible for *organizing and guiding* Community of Practice events, consistently *addressing member inquiries*, and ensuring they stay informed with *external information updates*. Furthermore, leaders are tasked with *handling the interface* between the Community of Practice and the official structures within the organization, including teams and various organizational departments. They promote *the growth of* Community of Practice *members* and actively contribute to building the practice by *expanding the knowledge base, documenting experiences and insights, sharing best practices, and developing tools and methods*. Lastly, leaders of the Community of Practice are responsible for *assessing the well-being* of the community and *assessing its impact on the organization's* members.

McDermott (2001) highlights that the leader's role involves preparing for, animating, and identifying important, or "*burning issues*". According to Lesser and Everest (2001), the leader is accountable for *ensuring the overall vitality and efficiency* of the Community of Practice and for *advocating the CoP's value within the formal organization*. Büchel and Raub (2002) observed that the leader plays a crucial role in *establishing the conditions* for productive collaboration within the network by *cultivating trust*.

Table 7 summarizes the current knowledge regarding main leadership characteristics.

Table 7. Summary of main leadership's characteristic at Community of Practice.

	<b>Characteristics</b>	<b>Author(s)</b>
1	Alocation working time to promote activities	(Wenger et al. 2002).
2	Handling the interface	(Wenger et al. 2002).

3	Promotion growth of members	(Wenger et al. 2002).
4	Expanding the knowledge base, documenting experience, and insights, sharing best practices, developing tools and methods	(Wenger et al. 2002).
5	Identification of “burning issues”	(McDermott, 2001; Büchel/Raub, 2002)
6	Ensuring the overall vitality and efficiency	(Lesser/Everest, 2001)
7	Plan and facilitations events, meetings	Wenger et al (2002) & (McDermott, 2001)
8	Addressing member inquiries	(Wenger/Snyder, 2000)
9	Establishing the conditions	(McDermott, 2001; Wenger et al, 2002) & (Büchel/Raub, 2002)
10	Management of the boundaries	(Wenger et al, 2002).
11	Cultivating trust	(Büchel/Raub, 2002)
12	Advocating the CoP's value within the formal organization	(Lesser/Everest, 2001)
13	Assessment the well-being and its impact on the organisation	(Wenger et al, 2002).

However, in well-functioning communities, the leadership is not reliant on one person. According to Wenger et al. (2002, p.36.), leadership should be distributed and be a characteristic of the entire community. While acknowledged experts can lend credibility to the community's mission and perspective, they may not always be the ones responsible for uniting the community.

Leadership within a community of practice can embrace a wide range of roles. Among them are the community organizers, experts, administrators, or coordinators etc. (Wenger et al., 2002, p.36). All these roles are important as Dubé et al. (2005) found that communities that had absence or lack of leadership just failed. Therefore, as Donaldson (2020) concludes, the design of the learning community should involve identifying and selecting core leaders “who will take on responsibilities for facilitating various levels of engagement, collaborative efforts and development of strategies and processes toward community growth and impact” (Donaldson, 2020, Community features).

To sum up, to establish and develop CoP successfully, it might help to apply the seven Cs key factors, such as cause, culture, conditions, cadence, content, contribution, and credit. Another seven Cs presented the stages of learning framework, and they are: conceptualize, capture, create, communicate, collaboration, consider, consolidate. Moreover, to lead the learning community, is vital to have effective leadership that includes dedicating time in supervision community's activities, organizing events and leading meetings; identifying burning issues, responding to participant's queries and fostering community's members development.

### **3.2.2 Case examples of establishing, leading and developing a learning community**

This sub-section discusses some real cases of learning communities implemented in various environments such as HEIs and organizations. It was important to discuss the experience of existing learning communities in companies as it proves evidence how vital self-learning and self-development are in real working life.

#### **Case 1 - Establishment and deployment of E-learning community of practice in Ireland for a Finnish company**

Based on Wenger's et al. (1998) theory of community of practice and on findings from online research and a survey (Makkonen (2013) outline the key steps in establishing and developing a learning community of practice that was implemented in practice in Ireland in 2013 year:

- 1) Use the key elements (domain, community, and practice) to define the community's focus.
- 2) Implementation of activity plan based on 4 of 5 stages of CoP development (Wenger, 2022): Potential, Coalescing, Maturing, Stewardship. The 5 stage of Transformation was not introduced due to unnecessary as EPN community of the case aimed for continuity.
- 3) Build community activities plan as the community should have a roadmap. These activities include:
  - "Knowledge sharing workshops
  - E-learning seminars
  - Training sessions
  - Online meetings (QA Sessions)
  - Informal face-to-face meetings".

An activity rotation was proposed as follow: annually, biannually, quarterly and weekly.

- 4) Establish a leadership. It is the coordinator's role to assume the responsibility for providing leadership and fostering encouragement.
- 5) Implement by connecting the people via LinkedIn and email messages and after that, in real-life cases, there was a seminar where the ideas of community were introduced.

During the period of attracting participants to a community, they faced an issue that it was difficult to reach the unknown people via email etc. as there was so much spam nowadays that people deleted messages without even reading it.

Another interesting aspect they mentioned related to a few cycles of energy which community might go through – high and low, and that was the reason why it required to fresh up new ideas, practices, new members etc. in order to spur the interest in the community.

Another challenge was “to meet the organizations’ decision makers face to face and convince them about the value of the community participation” as in that period of time “it can be seen that many organizations in Ireland are limiting their knowledge workers’ participation in external communities during the official working hours and based on my personal experience from the time when I lived in Ireland, the weekends are generally preferred to be kept “work-free”.

“During the incubation period communities are particularly fragile and this is why it is important to identify the possible challenges at the very beginning and to have suitable strategies to avoid the loss of energy in the EPN Community”. (Makkonen, 2013, p.56, 76-77.)

This case illustrates an example of potential benefits of the Community’s of Practice implementation. It shows the experience of implementing of Wenger’s et al. (2002) theory of key elements, such as domain, community, and practice. Moreover, the case emphasizes of the critical role of leadership within the community, which will also be discussed in more detail later in the study. Finally, this is a practical example of utilization of five stages of CoP development proposed by Wenger (2022).

According to Wenger et al. (2002), communities of practice became an obvious part of the management agenda. As seen from the example of Case 1 above, organizations in a wide range of industries ground their knowledge initiatives on communities of practice. Another example of the learning community are the leading Finnish companies, such as Nokia, which is discussed next.

### **Case 2 - Nokia**

**Nokia** has its own Learning & Development Hub which is available for customers, partners, and employees of Nokia. This Hub provides access to Nokia’s learning library, learning communities and talent management tools. The last one is for employees only.

NLDH include Support portal that gives access to solution, solving & production documentation, different types of tools (project management, software, e-learning and collaboration) tracking of help desk cases. This portal is designed for Nokia customers & partners.

All Nokia's learners at NLDH have their own personalized learning page (also known as a Learner Home) after registration on portal. From this page, a learner can search for trainings, certifications & NokiaEDU Apps & Resources. Training can be classified by following types: 1. "Online Class (eLearning), 2. Event/Session (Instructor-Led Training or Virtual Instructor-Led Training), 3. Curriculum, 4. Material (Supports documentation), 5. Video (Recording of training), 6. Test (Exam), 7. Posting, 8. Program". (Nokia, 2019)

NLDH provides customized learning which "tailored to match individual interests, learners receive a customized selection of learning opportunities powered by Machine Learning and social collaboration". (Nokia, 2019). It also allows users have the ability to search for training sessions based on subject, date, type of training, and rating within the platform.

The "Connect" section of NLDH includes communities, teams which displays communities that the user can view and join, as well as user and activity updates from connections, team members etc.

Nokia's learning community (platform) is an opportunity for the individual learner to study critical skills, to self-develop and prove their competence by taking exams and getting the certifications. (Nokia, 2019)

This case demonstrates the widespread adoption of learning communities as a learning solution within a large corporation. It also shows the importance of implementing learning communities for study, self-development, taking exams and getting certifications. Furthermore, it highlights the compelling benefits of such an approach, encouraging employees to engage in self-development and demonstrate their competencies.

According to Wenger (2022), "Communities of Practice are everywhere". They can exist at schools, at companies and in HEIs. The example of implementing CoP at university will be discussed next.

### **Case 3 – Community of practice (CoP) at a regional Australian university**

In 2014, the CoP was built in Charles Darwin University Australia to clarify somewhat ambiguous academic integrity policy and make it more understandable for teachers and students.

Firstly, the three Wenger's main characteristics of the CoP were used in this case: domain, community, and practice. Domain is an interest about translation of academic integrity policy in order to find out the reason of its inconsistent application. All members of the CoP shared a practice and community – it was committed to meet regularly from 2014 to 2021 to deep the knowledge of academic integrity and inconsistent enactment causes.

The five main Wenger's stages of implementation were also applied in this case. The result is shown below on a Table 8.

Table 8. Stages of the COP development (Reedy et al., 2021, p.4.)

Stages	Description	Key activities
Stage 1: Potential	People face similar situations with the benefit of a shared practice	Finding each other and discovering commonalities
Stage 2: Coalescing	Members come together and discover their potential	Exploring connectedness, defining joint enterprise, negotiating community
Stage 3: Active	Members engage in developing a practice	Engaging in joint activities, creating artifacts, adapting to changed circumstances, renewing interest, commitment and relationships
Stage 4: Dispersed	Members no longer engage very intensely but the community is still alive as a force and a centre of knowledge	Staying in touch, holding reunions, calling for advice
Stage 5: Dormant	The community is no longer central but people still remember it as a significant part of their identities [and practice]	Telling stories, preserving artifacts, collecting memorabilia

The members of the community gathered evidence from various sources, including their professional development records, records of consultations with staff and students, and evidence of conference presentations. As a result, an evaluation and narrative of each stage of the lifespan were made, as outlined below.

#### *CoP stage 1: potential (2014-2015)*

The 13 members of the CoP gathered to discuss plagiarism cases in the faculty. They mentioned a very emotional and inconsistent reaction of most of the teachers to student's violation of academic integrity. Inconsistent approaches were caused by confusion of university policy for addressing breaches of academic integrity. Additional, teachers were estimating if they should report about breaches of academic integrity or not as there were no consequences if you don't inform but a huge increase of work if they did it. The main idea of the discussion was how to teach students about academic integrity instead of punishing them. The goal was to find the ways to support professional staff to deal with students' academic integrity problem.

Beyond that there were a difference of reporting in different disciplinaries. The teachers of the language programs were less intended to report on violation of academic integrity while in engineering or accounting lectures were stricter in their punishing approach. Another important outcome was made that most of the students were unaware of the consequences of academic misconduct.

The CoP participants developed a quiz and a checklist that would support the students understanding of academic integrity. The creation of the "Student Expectations" document aimed to provide students with guidance on the necessary actions to develop skills and avoid plagiarism.

#### *CoP stage 2: coalescing (2015-2016)*

In this stage three professional staff of community continue to meet, other members took on secondary participation. The main focus on this phase was shared accurate reading of the academic integrity policy with discussing in detail every aspect of the policy. The interesting fact was that after 6 months of reading together CoP members had different understanding of the policy. The conclusion was that the policy is vague and needed in reconsideration and updating. The participants of CoP made a grant application for review and suggestions which was successful and later the plan for resources creation was developed.

#### *CoP stage 3: active (2016-2017)*

The third stage includes the creation of the academic integrity resources. The members of CoP prepared two flow-charts by using the university's design studio. The first visualization was for the staff of the university and the second one was for the students. Both charts explain the investigation process if there is a subject of the suspected breach of academic integrity. During

this work a few staff from the design studio became a transactional member of the CoP and the manager become a core member. The creation of the charts took one year to design it as there were many iterations.

During the creation of the visualizations, the members of CoP had consultations with the end users, other members of the university communities via workshops to get the reaction and feedback. As the outcome, they developed 5 cases of the violation of academic integrity policy based on true stories and presented them in a comic style. All developed resources were on the university website that provided easy access to all materials and support and were presented on different sessions with students, workshops etc.

*CoP stage 4: dispersed (2018-2019)*

At this stage the meetings were held mostly on as-needs basis. The focus was on distribution and usage of the resources which were created on the previous stage. Based on feedback that the CoPs members get, the flow charts helped students to better understand the concept of plagiarism and its consequences. Teachers at the university used these resources as well to support students before and during semester. On this stage the visibility of the flow charts was increased by printing the posters and placing them in different locations around the campus.

*CoP stage 3 revisited: active (2020-2021)*

The new opportunities brought 4 CoPs members together to meet on a regular basis. "First, the national university regulator, the Tertiary Education Quality and Standards Agency (TEQSA), invited the CoP to submit case studies of the suite of resources to be profiled in the TEQSA Academic Integrity Toolkit (TEQSA 2020)". (Reedy et al., 2021, p.15.) Additionally, the participant of the CoP submitted a nomination for the Australian Awards for University Teaching. During the serious restructuring at the university a few members of the community had to quit and that made the remaining members to reflect about value and importance of the community at this stage.

At this phase, members met regularly over six months to document the path of the community and discuss about the learning theory and experiences.

*CoP stage 5: dormant (2021)*

The final activity of the CoP finished in 2021 but the CoP members keep reflecting on the activities and what the involvement in this community means for all of them. "The concept of the street-level bureaucrat (Lipsky 1971) emerged and disrupted the presumption that hierarchical approaches to policy lead to enactment of policy as intended." (Reedy et al., 2021, p.17.)

To summarize Case 3, the authors stress that it was a useful experience for the CoP participants to develop their skills as street level bureaucrats while identifying the issue in the policy, creating, and developing the resources instead of inert acceptance of policy's uncertainty and ambiguity. "The CoP also informed the policy shaper (TEQSA) and contributed to shaping the policy environment through inclusion of case studies developed by the CoP in TEQSA's Academic Integrity Toolkit (2020). That is, the resources generated to address problems with the accessibility of institutional policy were used as exemplars of good practice by the national regulating body." (Reedy et al.,

2021, p.16.) The learnings from Case 3 are further summarized in Table 9 that points out the main stages and features implemented as the CoP at an Australian university.

Table 9. Summary table of CoP development stages and its results of Case 3.

<b>Stage</b>	<b>Shared concerns</b>	<b>Outcome</b>
CoP stage 1: potential (2014-2015)	Inconsistent teacher's reaction to student's violation of academic integrity & student's unawareness of the consequences of academic misconduct.	Development of quiz, checklist and "Student Expectations" document
CoP stage 2: coalescing (2015-2016)	The vagueness of the academic integrity policy	A successful grant application and the development of the project plan
CoP stage 3: active (2016-2017)	Complex processes of translating the academic integrity policy into flow charts.	Creation of the academic integrity resources – flow charts for students and teachers
CoP stage 4: dispersed (2018-2019)	Meetings took unfrequently – to gather to deal with issues or prepare for conferences. No concerns at this stage	The resources of the previous stage made work of CoP visible to university management, teachers and outside the university. The CoPs members got an invitation to be on academic integrity working group.
CoP stage 3 revisited: active (2020-2021)	The CoPs members mostly theorized their experience. No concerns at this stage.	Creation of the case studies, nomination documentation and evaluation of the CoP
CoP stage 5: dormant (2021)	Improvement of critical skills and ability to identify the issue in the policy, creating and developing the resources instead of inert acceptance of policy's uncertainty and ambiguity. No concerns at this stage, the main activity finished at the previous stage.	Informing the policy shaper (TEQSA) and contribution at it though the developed CoP's case study in TEQSA's Academic Toolkit

This case illustrates the implementation of Community of Practice within a HEIs by a group of professional educators. What adds an interesting dimension to this implementation is that the educators selected this specific learning community model instead of a Professional Learning Community. Furthermore, this example provides valuable insights into the practical application of Wenger's (1998) concept, such as the

stages of its development. It also illustrates the outcomes of implementing Communities of Practice at the university level.

To round up, this section covered the existing knowledge related to the establishment, leadership, and development of learning communities. Key findings from the literature include five primary stages of Community of Practice development as proposed by Wenger (2002), six crucial success factors for community establishment identified by Borzillo (2007), Lancaster's Cs model for creating successful learning communities, Conole's design framework of 7Cs for learning, and the pivotal role of leadership in achieving community success. Moreover, this section discussed case examples of implementing learning communities across various types of organizations. Examples include a Finnish company's efforts to establish a learning community in Ireland, Nokia's learning hub, and the Community of Practice at an Australian university. In many cases, in addition to the organizational set-up, the community may need a suitable curriculum. This subject will be discussed in the subsequent section.

### **3.3 Selecting the Content and/or Building a Curriculum for the Learning Community**

Along with the type and key methods and principles, the content is also vital for most of the learning communities as it connects participants with their goals and determines their activities. Therefore, this section examines the existing range of content and strategies that are used in different types of learning communities.

#### **3.3.1 Role of Content in Different Types of Communities**

This sub-section examines the difference between the differences in content of four types of communities: Professional Learning Communities, Innovative Knowledge Communities, Communities of Practice and Social Spaces.

*Professional learning communities* (PLC) use various tools, tasks and technics that are helpful for improving teaching practices and student learning outcomes. Hord et al. (2009) proposed some tools and tasks to help the educators to structure “*learning opportunities*” (Hord et al., 2009, p.2) that allow the community members to learn approaches to improve their professional Learning Communities. By learning opportunities, the authors mean the events on a specific topic with a certain plan, lists of

questions, proposed materials for practice, and an estimated time that it might take. The learning opportunities are provided for 6 main components of PLC: 1) shared believes, visions and values, 2) shared and supportive leadership, 3) structural conditions, 4) relational conditions, 5) intentional collective learning, and 6) shared personal practice. Above that, there is an extra block with learning opportunities that provides the materials and techniques that should help to better understand what a PLC is, and what elements make it effective. The more detailed information is gathered in Table 10 below.

Table 10. Key components of PLC and their descriptions.

Components	Description
1. Shared believes, visions and values	the learning opportunities that support members to find their own approach of learning, create collective efficacy, identify their core value
2. Shared and supportive leadership	the learning opportunities that cover open feedback to a principal, "differentiate decision making" (Hord et al., 2009, p. 65), building a strong culture, implementing shared leadership etc.
3. Structural conditions	the events which help to identify the essential, structural needs of the PLC, to analyze the effectiveness of the meetings and look for their improvements, to find the possibilities for the community development, the explanation of the work the educators do in the community, to identify their learning goal and how their learning affect the student's learning.
4. Relational conditions	discover the trust and its effect on the teacher's communication, the group's current stage and what steps are needed for moving forward, the recognition of possible conflicts and managing them, methods how to reduce conflicts etc.
5. <i>Intentional collective learning</i>	the learning opportunities that help to set the norms of deep learning, assess the educators' learning together, develop an action plan for the goals the educators have, assess the development growth based on nine factors as PLC need to develop through self-monitoring.
6. Shared personal practice	the learning opportunities that has a focus on identifying the key areas of student's learning, exploring four conversations models and roles of coaching, writing a reflection protocol

The action plan or intentional collective learning comes closest to *the curriculum*. As Hord et al. (2009) emphasize, the materials and the idea of learning opportunities are aimed at supporting the changes and improvements in student's learning.

According to Wenger et al. (2004), *the Community of Practice* (CoP) are developed in different environments with different goals and purposes, therefore “the mode of communication and capturing knowledge matches the demands of actual use” (Wenger et al., 2004, p. 39). By practice Wenger et al. (2004) mean a “set of common approaches and shared standards that create a basis for action, communication, problem solving, performance, and accountability” (Wenger et al., 2004, p. 38). These recourses include a diversity of knowledge kinds, such as stories, theories, rules, principals, articles, lessons learned etc. They also include books, articles, web sites that members are shared with each other. An effective practice is integrated into people’s work and organise knowledge or the content in the way how it will be useful to practitioners inside a certain community. Wenger (2004) also emphasizes that successful practice depends on the balance between activities and things such as documents or tools. Therefore, the content plays a truly critical role in CoP.

*The Innovative Knowledge Communities* (IKC) rely on the same shared goals, practices as the CoP (Hakkarainen et al., 2004). “IKCs create similar reserve of collaborative activities, tools practices, and methods, as well as shared stories and understanding that is the case in CoPs.” (Hakkarainen et al., 2004). At the same time, IKC vary in many ways. In IKCs, the accomplishments of communities and the skills and expertise of individuals mutually influence each other, leading to a co-evolution process. Individual achievements support the collective activities and changes the collective practices. Also, ICs creates new knowledge and innovations. To address dynamic and turbulent environment, in IKC people are creating new forms of acting, working and learning to be able to deal with it. In IKC, “learning is understood as a collaborative effort directed toward developing some mediated artifacts, broadly defined as including knowledge, ideas, practices, and material or conceptual artifacts”. (Paavola et al., 2004, *Toward the Knowledge-Creation Approach to Learning.*)

*The social learning spaces* theory (SLS) has a big impact on value creation concept. From this perspective, Wenger et al. (2020) see “the emphasis on the experience of learners caring to make difference rather than on knowledge, skill, or curriculum” (Wenger et al., 2020, p. 48). “SLS features articulated are that they have a focus on people and their participation and that members drive the agenda”. (Mercieca et al., 2021, p. xi.) In this approach, learning is founded on shared involvement that challenges participants to expand their boundaries of learning. Within this context, the significance of meaning and identity takes precedence, focusing on a sense of "caring to make a

difference" rather than merely aiming for proficiency within a social practice (Wenger-Trayner et al., 2020). Social learning spaces extend beyond physical locations shared in a specific geographic area. They encompass globally dispersed networks and online communities. (Mercieca et al., 2021, p. xi.)

Thus, in all types of communities, the role of content can be significant, although it can vary depending on the community's concept or purpose. Moreover, a curriculum can also be an essential part of the content. Next sub-section will discuss the curriculum design as part of learning content.

### 3.3.2 Curriculum as Part of Learning Content & Curriculum Design

*Curriculum* is the "inventory of activities related to the design, organisation and planning of an education or training action, including definition of learning objectives, content, methods (including assessment) and material, as well as arrangements for training teachers and trainers." (UNESCO. IIEP Learning Portal. 2014. Terminology of European education and training policy.) Tractenberg et al. (2020) describe four curriculum types:

1. *Intended curriculum (or official or planned)*: The formal specification of what students are expected to learn and demonstrate, including their Knowledge, Skills, and Abilities.
2. *Implemented curriculum (or the curriculum in action or the taught curriculum)*: how the curriculum planned for students is put into practice, including the teaching, and learning activities, interactions between teachers and students, and among students themselves.
3. *Attained curriculum*: what learners ultimately gain and can show after following the implemented curriculum.
4. *Hidden curriculum* refers to unintentional effects of curriculum, which embrace social, cultural, and disciplinary norms, as well as the transfer of knowledge, skills, and abilities to learners in a somewhat consistent manner. (Tractenberg et al., 2020, p.3)

"Curriculum development in higher education should follow a formal process". (Tractenberg et al., 2020, p. 2.) Curriculum design also includes potential models of curriculum's design, categories to determine its quality and main aspects of curriculum's design evaluation. However, according to Tractenberg et al. (2020, p.4), curricula in

higher education tends to be informal. They are typically designed based on the expertise of the available personnel and the content or competencies considered necessary for maintaining the credibility of both graduates and the programs.

The essential features of an effective curriculum include *defining of general context*, such as stakeholders, lectures or professors, desired performance, competences etc.; *duration, composition* and *content*. Stress is on ensuring both teaching and learning. (Tractenberg et al., 2020, p.4). Tractenberg et al. (2020) described five phases in curriculum design.

*The phase one is "Select or identify learning outcomes (LOs)".* LOs should be 1) specific and well-defined 2) realistic 3) rely on active verbs, phrased in future tense 4) focus on learning products, and not on learning processes 5) simple 6) frames in terms of the program 7) appropriate at number. (Tractenberg et al., 2020, p.8.) Additionally, there are five principles of expressing LOs. They should be "specific and actionable; connected with learner work; derived collaboratively (across disciplines); supportive of assessment that generates actionable evidence; focused on improvement". (Tractenberg et al., 2020, p.8.)

*The phase two is Select or develop learning experiences that will help students achieve the LOs.* This phase involves identifying Learning Experiences (LEs), such as lectures, webinars, work in groups, instruction etc. that would lead to the LOs. LEs and LOs have to be aligned.

*The phase three is Select or identify content that is relevant to LOs.* On this stage is important to find content that will be featured in the LEs. It should include only material that is likely to support the achievement of the specific LOs and does not try to be universal. LOs are helpful on focus on relevant content and escape non-essential materials.

*The phase four is Identify or develop assessments to ensure learner is progressing towards Los.* Assessments are needed in order to give opportunities of demonstrating student's progress. The assessments could be tests, feedback surveys, evaluations etc.

It's vital to mention that there are two possible types of assessment: 1) Evaluation of learning – the changes in learner's performance. 2) Evaluation the effectiveness if the instructions - if the LOs were achieved. (Tractenberg et al., 2020, p.9.)

*The phase five is Evaluate the effectiveness of the learning experiences for leading learners to the LOs.* This final step involves collecting data about the program in order to define its quality and effectiveness. (Tractenberg et al., 2020, p.11.)

The curriculum design that is based on these principles is shown in Figure 8 below. The idea of this schema is that, for each phase (they are represented as rectangles), there are main questions that should be asked. These questions are shown in diamond figures. If or where the questions haven't been satisfied, that phase should be revisited and revised. In the figure, these areas are shown as red arrows. Afterward, it can be pushed forward with the green arrows to the next phase. After finalizing all phases and answering all questions, the curriculum or instruction can be characterized as successful. On the schema, it is shown as a star.

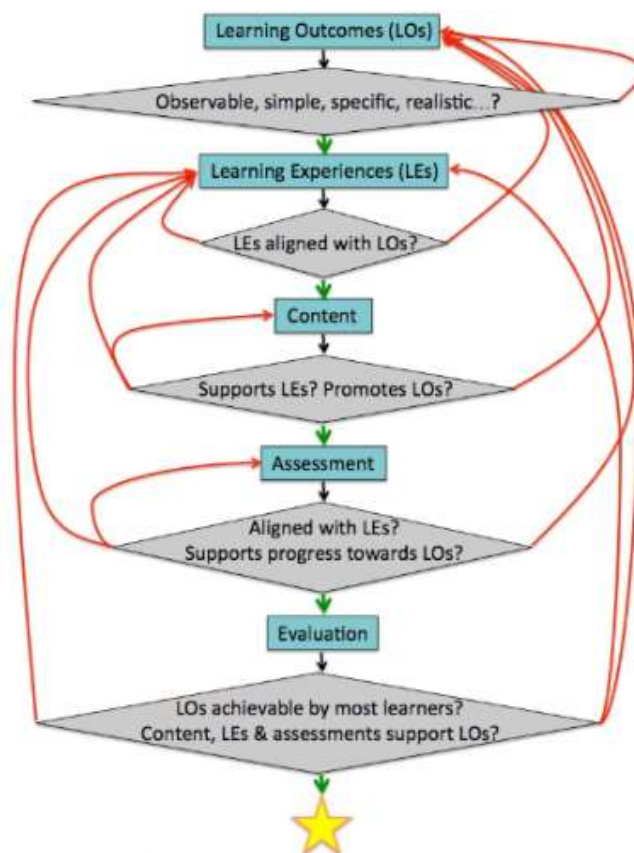


Figure 8. Five phases of curriculum design and their dependencies (Tractenberg et al., 2020, p.6.)

The essential point after implementing this design is fully documenting and describing the conceptualization of the program, sharing its features and instructions. This can be valuable when training and certifying new instructors for that curriculum. Additionally, it is useful for learners, as having transparency regarding the actual curricula enables them to leverage their prior learning experiences. (Tractenberg et al., 2020, p.12.)

Another model of curriculum design was proposed by Thornton (2012). Thornton (2012) emphasizes that it is essential to follow the framework that will help to conduct the comprehensive content, curriculum for self-learning. The proposal focuses on modifying an existing curriculum for a self-learning rather than creating a completely new one from scratch. Their framework consisted of three parts as shown in Figure 9.

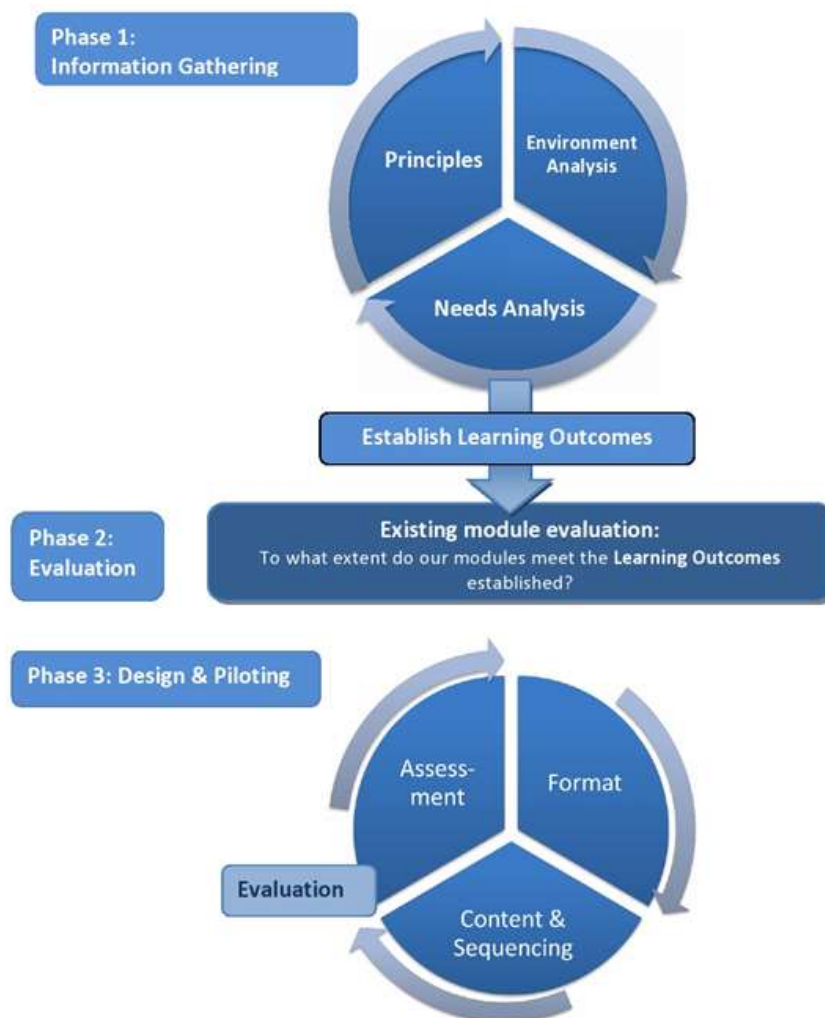


Figure 9. The Curriculum modification framework (Thornton 2012).

As seen from Figure 9, the first phase of Information gathering consists of three steps: *principles, environmental analysis and needs analysis*.

By examining the *environment* and the requirements of community learners make it easier to establish learning objectives for evaluating the curriculum. The purpose of conducting an environmental analysis is to identify the factors that will impact the curriculum design process.

The *needs analysis* phase may include gathering information from diverse stakeholders and reviewing literature on self-directed learning and learner autonomy. This process aids in gaining a comprehensive understanding of the skills required by students and identifying those that should be emphasized.

The *principles* step explores the pedagogical and methodological theories that underpin on comprehension of self-directed learning. Based on the results of these stages the learning outcome can be established. (Thornton, 2012)

The next Phase is *Evaluation*. All information that was gathered during the first phase could be applied for current modules of curriculum in order to meet the set outcomes. The *evaluation* aims to point any possible gaps in the present content and expose areas which need changes and development. The Evaluation Stage involves investigating existing materials and gathering data from students about their experience learning these study paths, modules and other content. (Thornton, 2012)

The final phase is *Designing and Pivoting* of new or adapted materials and assignments procedures. It consists of three parts: Assessment, Format, Content & Sequencing. This phase might also require consideration of whether regular evaluation processes can be built into the curriculum to meet the learning outcomes. The assessment can identify elements that may need regular adjustments or further enhancements, ensuring the ongoing relevance of the curriculum. This can be achieved by consulting with different stakeholders and reviewing relevant literature on self-directed learning and learner autonomy. (Thornton, 2012)

However, following the curriculum design, it is essential to evaluate its quality and effectiveness in its creation. UNESCO International Bureau of Education (2016) provides four main categories for estimating the curriculum quality: *development of the curriculum*,

*the curriculum itself, implementation of the curriculum, and evaluation of curriculum.* It shown in Figure 10 below.

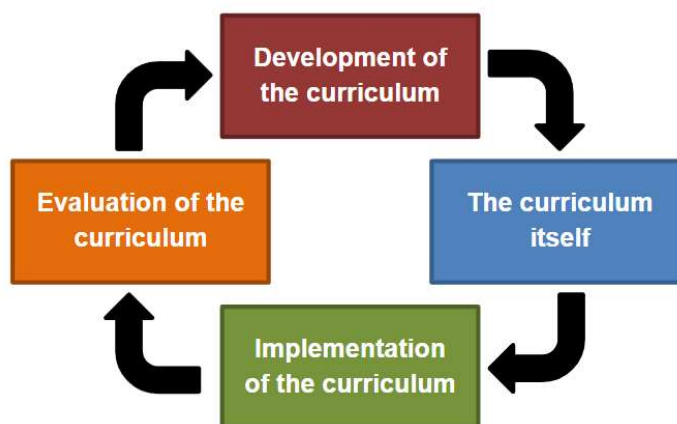


Figure 10. Four categories for estimation curriculum's quality (Stabback, 2016, p. 9).

The first category *development of the curriculum* is good in case the curriculum is: *planned and systematic, inclusive and consultive, led by curriculum professionals, cyclical in nature* and, finally, *sustainable*.

The second category, *Curriculum itself*, could be of good quality in case: 1) Values each student and treat equally. 2) It contains high quality content which is up-to date and relevant and appropriately demanding, sequenced and progressive; it's balanced and integrated. 3) It is well-organised and structured. 4) It is rooted in a collection of theoretical and philosophical convictions concerning the way children acquire knowledge and skills.

The third category is *Implementation of Curriculum*. To make the implementation effective, it is vital to involve expectations on students, teachers, learning environments, parents and employers, educational systems and other authorities.

The last category is *Evaluation of the curriculum*. To get most of the evaluation it would be great if it was done: 1) in a systematic and planned way (clear purpose and scope; at different levels in the education system; using valid and reliable data; within a clear quality framework); 2) regularly; 3) by suitably qualified and experienced people.

Additionally, learning community might require to decide on the proportion of learning and self-learning. It will be discussed in the next sub-section.

### 3.3.3 Learning vs. Self-learning Content, and Learning Diaries

Generally, content may vary within different disciplines and depends on content's structure instructor can play different roles. "*Structured* content emphasises the instructor's role as a disseminator while largely *unstructured* content is required more involvement from the instructor". (Nigel et al., 2021.) Moreover, learner's styles and goals differ from each other due to the variance background knowledge, and it affects their performance as they might have different approaches towards learning (Premlatha et al., 2015). Structured content means that someone structures and prepares it, and in this case, it can be fair to compared with *a curriculum*. Unstructured content can be co-created together with the participants of the learning community, along its lifecycle.

Here, it is important to give an example of the study conducted by Premlatha et al. (2015). This study discusses the significance of processes involved in e-learning content design, which are essential in providing learners with appropriate and personalized learning content. The study by Premlatha et al. (2015) stresses the importance of the following points.

Firstly, all learners have to have the access to educational materials. The composition of learning materials or learning objectives which represents the materials that are located in web environment should begin with by choosing the instructional and learning needs and then selecting the best resources.

Secondly, when creating content, it is crucial to consider its adaptability in terms of reusability and editability. Creation of a structural content is not easy and takes time, therefore the "systematic approach requires a sound architecture that gives rise to the overall success of creating, using and reusing" materials. (Premlatha et al., 2015, Learning objects design)

Thirdly, Premlatha et al. (2015) proposed the idea that lots of learning materials might be frustrating for the learners and demotivates them. Therefore, it would be better to provide the student's preferred types of materials. Different individuals may have varied preferences such as verbal communication, watching videos while others may prefer

analyzing written text, and so on. Also, all materials should be presented in organized and comprehensive way.

Additionally, during online studies, it is important to understand student's learning experience and the climate of the course or learning community. Kivimäki et al. (2021) analyses the possible improvement of teaching and learning by course diary. The course diaries "aims to correspond to a student's needs and goals during the course through adaptive learning and teaching". (Kivimäki et al., 2021, Introduction). As an example, at Aalto Course Diaries students can evaluate their learning experience on each topic "through three fixed-scale items and three open-response items: competence (1), difficulty (2), feeling (3), expectations (4), notes (5) and reflection". (Kivimäki et al., 2021, Methods). All gathered data is aggregated and visualized in the Moodle platform where teachers can see it, as illustrated in Figure 11.

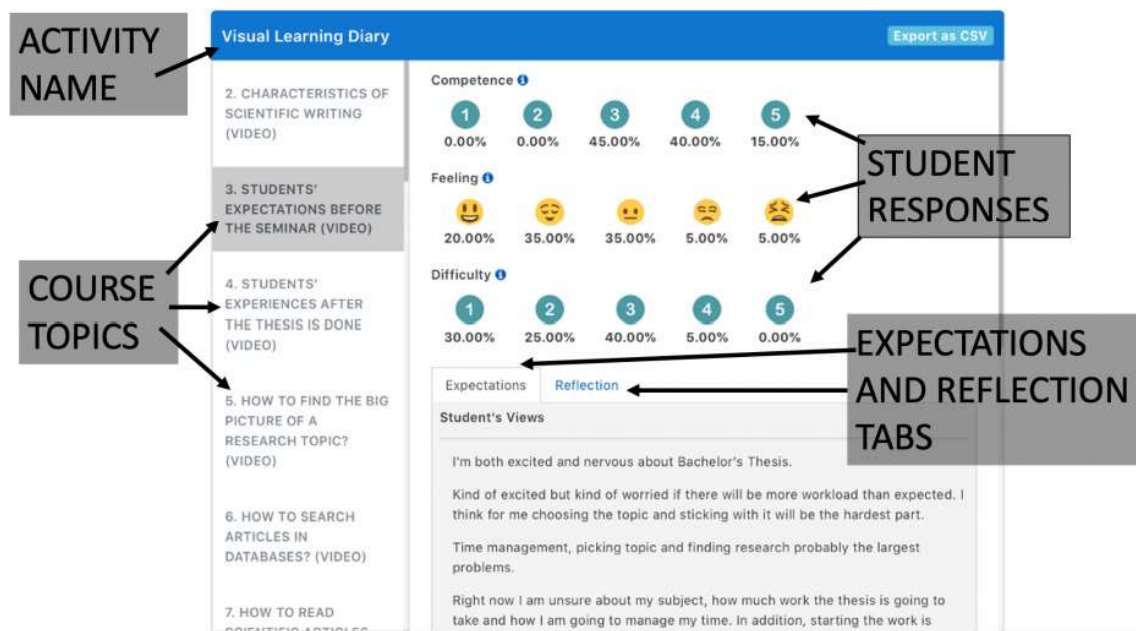


Figure 11. Teachers report view in the Moodle (Kivimäki et al., 2021, Methods).

Based on findings by Kivimäki et al (2021), the Course Diaries can be adopted to get to know how students are learning and to help teachers to prepare better for their lessons. The goals of course diaries are shown in Table 11 below.

Table 11. Teacher's goals (Kivimäki et al., 2021, Methods).

Category	Count	Example and coding criteria
Student monitoring	5	Teacher aims to monitor students to know how they are doing: <i>I wanted to know what's happening on my course students' heads. I think it's important to get some kind of response during the course from students. Do they think they are learning or not?</i>  Distinctive words: know, real-time, tracking
Preparing for teaching	4	Teacher aims to use the data for preparing better in teaching activities: <i>To know students' expectations and immediate feedback already during the course, in order to take them into account during the implementation.</i>  Distinctive words: prepare, improvement, implementation
Promoting deeper learning	2	Teacher aims to promote deeper learning on his/her course: <i>I wanted to improve the deep approach learning in my course. The course goes through lots of different topics and I hope that students would learn to understand them, not just to "repeat a phrase explaining them".</i>  Distinctive words: deep, comprehensive.

Kivimäki et al (2021) states that regular course feedback was collected after the course and is mandatory for all courses. Therefore, the learning diary helped their team to monitor students' success, to be better prepared for the lessons and promote better teaching and learning. (Kivimäki et al., 2021, Conclusions).

As for the learning diaries, Bartlett et al. (2015) believe that a well-designed diary can provide significant insights into experiences over time while a badly designed diary may require significant effort but yield little useful information. According to Bartlett et al. (2015), these fourteen questions to consider before applying and designing diaries. These questions are presents on Table 12. These are the types of questions which "*solicited diary techniques* can help to answer". (Bartlett et al., 2015, p. 31). Bartlett et al. (2015) describes a threefold typology of research questions that are suitable for solicited diary methods. First one types of questions are designed to get individual information over time. These techniques are useful when people's experience, practices, actions etc. are needed to determine. The second type of research questions are designed to get an understanding of within-person changes throughout the time. Here is the focus on collecting an understanding of how people's thoughts, experiences, reactions etc. change over time. The third types of questions are designed to make analysis of within-person changes and people's differences in these changes.

Table 12. Fourteen questions before considering using the diary methods (Bartlett et al. 2015, p.28).

1. Is the tool appropriate for your research questions and aims?
2. Will the diary be used on its own or as part of a mixed methods design?
3. Is its purpose to inform or confirm other data?
4. Are you using diary method to collect structured, semi- or unstructured data, or a mix of these forms of data?
5. How will you analyse your data?
6. Are participants aware of the time commitment and effort involved in completing the diary?
7. Have you decided on content and structure and have you included this in your instructions?
8. Are the instructions and terminology clear?
9. Have you considered any specific requirements of the participant group you are targeting?
10. Have you allowed time for developing and piloting your diary?
11. How will you reinforce data recording and support participants throughout the data collection period (e.g. by regular personal or telephone contact)?
12. How will you address potential respondent fatigue?
13. How will you deal with attrition and partial completion of diaries?
14. Have you considered alternative formats to the written word?

Schefer-Wenzl et al. (2021) describes their experience integrating learning diaries in three courses which had different types of learning diaries. The first course design had in-hour classes during which new topics were introduced. All student of the course had to have some basic programming skills. So, the main role of the diaries was to find out the learning progress of each topic. In these learning diaries students answer questions such as: "What did I learn? What was new to me? Was there something that changed my views and why? Focus on and analyze the themes important to you. What did I not understand? What went against my own ideas and why? What was less comprehensible and why? Focus on and analyze questions that left you puzzled." (Schefer-Wenzl et al., 2021, p.933).

The second course was for students with basic understanding of software engineering methods and solid programming skills. The course aim to help students to deepen their knowledge. All topics of the course were needed to be learn by self-studying, so the learning diaries had a different role. The students were supposed to reflect on what they

understood, what was unclear, write their clarifying questions etc. in the learning diaries. During the next classes the input that was given in the learning diaries helped to clarify the questions and give more explanations.” (Schefer-Wenzl et al., 2021, p.933).

For the third course the students write their reflections of the achieved knowledge, documented the rules for technical writing and could ask a certain question regarding their studies in the learning diaries. Additionally, the learning diary was used as a communication tool with the teachers where students could propose topics for the next classes as well, especially when provided with a template, which had a positive effect on the students.

Schefer-Wenzl et al., (2021) found during their research that the learning diaries make a very useful tool that could be integrated in different types of courses and learning communities. The vital thing is to determine the teacher’s and student’s goals, to design the learning diary well, find the best approach so to get the most significant insights from it.

In conclusion, learning diaries can serve as an effective tool for understanding students' learning experiences and the overall climate of the course or learning community. The next section will present the conceptual framework of the Learning Community.

### 3.4 Conceptual framework of Learning Community

Table 13 below shows the conceptual framework for building, developing and leading a learning community. It consists of three main parts: 1) Selecting the Learning community type, 2) Establishing, developing, and leading a Learning Community and 3) Building a Curriculum.

Table 13. Conceptual framework for building, developing and leading a Learning community.

1. Learning Community Type	2. Establishing, developing, and leading a Learning Community			3. Curriculum design
	Stages of development:	Principles	Success factors	
<b>Types of Learning Communities:</b> 1. Professional Learning Community (DuFour & DuFour 2011, Hord & Sommers 2007) 2. Community of Practice (Wenger, 1998; McDermott & M. Snyder 2002) 3. Innovative Knowledge Community (Hakkarainen, Paavola, & Lipponen 2004) 4. Social Learning Space (Wenger-Trayner & Wenger-Trayner 2020)	1.Potential 2.Coalescing 3.Maturing 4.Stewardship 5.Transformation (Wenger et al., 2002)	1.Design for evolution 2.Open a dialogue between inside and outside perspectives. 3.Invite different levels of participants. 4.Develop both public and private community spaces. 5.Focus on value. 6.Combine familiarity and excitement. 7.Create a rhythm for the community. (Wenger et al., 2002)	1.Cause 2.Objectives 3.Sponsorship 4.Leadership 5.Environment 6.Conditions 7.Content 8.Contribution 9.Credit 10.Results (Borzillo, 2007) (Lancaster, 2020)	<b>Phase 1. Information Gathering – Establishing Learning Outcomes</b> a) Principals b) Environmental Analysis c) Needs Analysis  <b>Phase 2. Evaluation</b>  <b>Phase 3. Design and Piloting</b> a) Assessment b) Format c) Content & Sequencing (Thornton 2012)  <b>Additional considerations</b> Learning vs. self-learning (Premlatha et al., 2015) and Learning diaries as a tool (Kivimäki et al (2021)

The first element of the Conceptual framework relates to selecting *the type of the Learning community*. For selecting the type, it is essential to understand the characteristics of the existing types of learning communities. Currently, the most frequently discussed types include (1) Professional Learning Communities (PLC), (2) Communities of Practice (COP), (3) Innovation Knowledge Communities (IKC) and (4) Social Learning Spaces (SLS).

For the HEIs content, for instance, Professional learning communities is frequently used due to importance in educational progress to promote students' success and achievements. PLC allows teachers, educators to gather and find the ways of educational improvement through shared values and vision, supportive leadership, collective learning with feedback in supportive conditions. At present, Professional Learning Communities (PLCs) are even included into Microsoft TEAMS for educators.

The second element of CF focused on the principles for *establishing, developing, and leading the Learning community*. It should include *Stages of development, principles, and success factors*. The stage of development aim to describe challenges that might be face during community's development. There are 5 mains stages: potential, coalescing, maturing, stewardship and transformation. (Wenger et al., 2002, p. 69). Additionally, the

second element of CF should contain the communities' principles such as: 1) Design for evolution, 2) Open a dialogue between inside and outside perspectives, 3) Invite different levels of participants, 4) Develop both public and private community spaces, 5) Focus on value, 6) Combine familiarity and excitement, and 7) Create a rhythm for the community. (Wenger et al., 2002, p. 49.)

The third sub-element of the CF consists of various factors gathered and combined from three main sources. These factors include: 1) The Cause or Wenger's et al. (1998) domain – find the main reason of the community existence. 2) The Objectives should help explain the community's value and thus to attract participants. 3) The Sponsorship can be made by investing sources such as time and financial resources. 4) The Leadership is the crucial factor for any learning community. 5) The Environment needs to be risk-free as a necessity to keep interactions within community productive. 6) The Conditions are a design of the environment which includes collaboration, access, communication, sharing. 7) The Content is the key to improving practice, having discussions, sharing experience etc. 8) The Contribution is trying to get a high portion of participant who will participate and increase the engagement. 9) The Credit or recognition that motivates a community. Giving credit to participants such as recognizing someone's progress or public thanks could help a community succeed. (Lancaster, 2020, p.187-189.) 10) The Results or the outcome of the learning community.

The third element of CF focuses on the guidance for building *the curriculum* for the Learning community. By Thomson (2012) the framework consists of 3 main phases: 1) *Information gathering and establishing learning outcomes*, 2) *Evaluation*, 3) *Design & Piloting*. Additionally, it takes into account the notion of Learning vs. Self-learning, as the content can be structured and unstructured, according to Nigel et al. (2021). Moreover, Premlatha et al. (2015) provides key content design principles, such as easy access to materials, their reusability and editability, and an appropriate amount of materials, among other factors. Additionally, a possible improvement for the community is the use of a learning diary, as suggested by Kivimäki et al. (2021), which helps in understanding the learning process and the overall community climate.

The next section will describe how the analysis of the current state was conducted, along with its main results and insights.

## 4 Starting Analysis: Environmental and Needs Analysis Before Launching the Learning Community

This section discusses the results of the environmental and needs analysis before launching the Learning community. The analysis is guided by the available knowledge and best practice discussed in Section 3.

### 4.1 Overview of the Starting Analysis.

This short section contains a brief description of *how* the starting analysis was conducted. The starting analysis focused on in deifying the current state of the following:

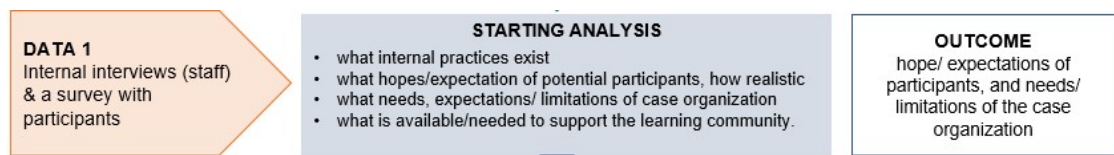


Figure 12. Starting analysis as element of Research design.

The Starting analysis was planned and implemented in a systematic way, based on available knowledge and best practice identified in Section 3 and summarized in the conceptual framework. The Starting analysis was done in three steps, according to the methods identified from literature and best practice, namely (a) *the Environmental* and (b) *Needs analyses*, and (c) a summary of the *Principles* as part of *information gathering, Phase 1*, for building the Learning community's curriculum (according to Thornton 2012), as shown in Figure 20 below. This approach was adopted as part of the Conceptual framework (Table 13, Element 3. Curriculum design).

Data 1 for the starting analysis was collected from (a) internal interviews with the staff members (for the Environmental analysis), 2 interviews; (b) the survey with the future participants of the Learning community (for the needs analysis), with 40 respondents, and (c) both the interviews and the survey results were also used to briefly outline the Principles of the learning community (but they are discussed in Section 5, as part of the Implementation plan). In this last part, the assumption was that more detailed Principles can be defined along with the development of the Learning community. For the start of the Learning community, only the most basic Principles were pointed out, so that to leave space for creative ideas of the participants as for further development for the future.

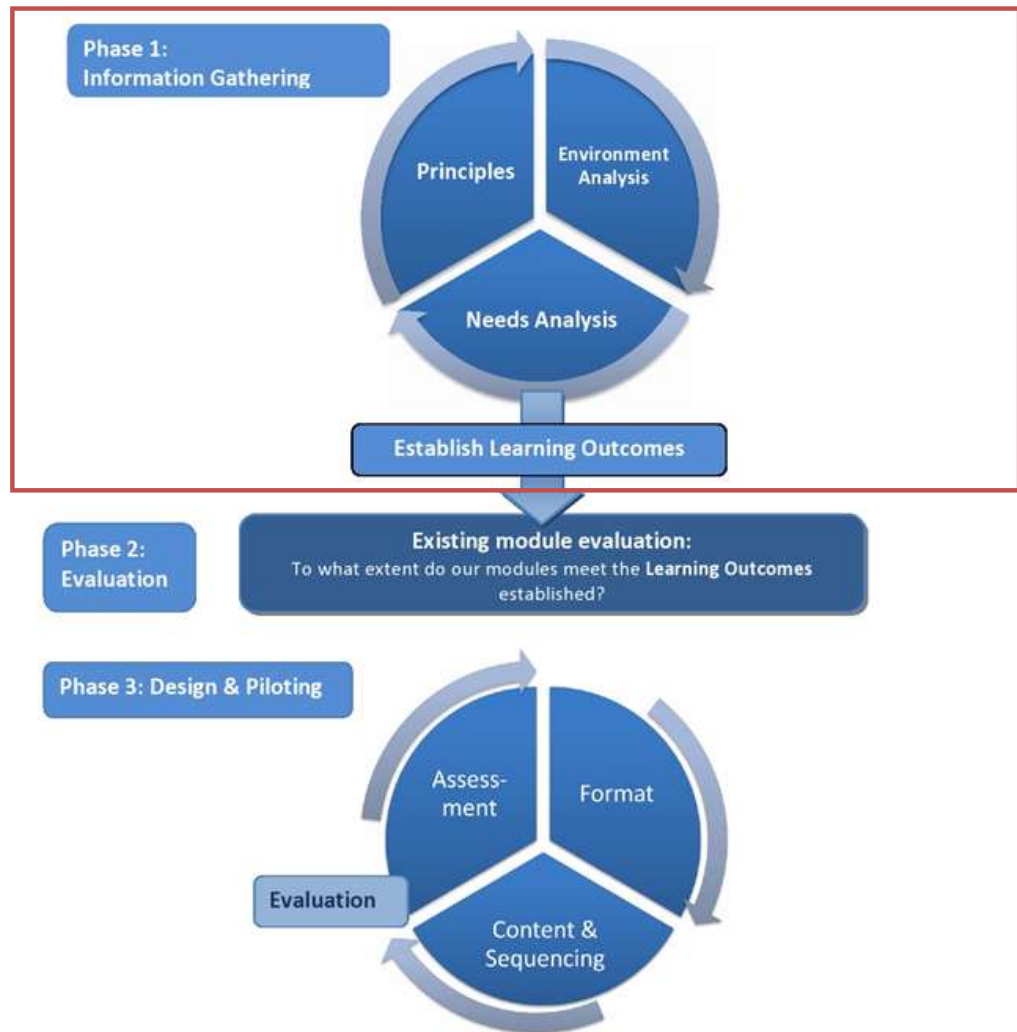


Figure 13. The Curriculum framework (by Thornton 2012), with Phase 1 pointed out for the tools for the starting analysis.

Next, the results of the starting analysis are discussed.

#### 4.2 What internal practices exist & what is available as support to the learning Community in the case organization: Environmental analysis.

The environmental analysis was based on the analysis of the staff interviews. Based on the results from the interviews, several important points came to surface.

First, there are currently no established learning communities that the thesis research could identify at Metropolia AMK (at of the moment of this thesis writing), not there were in the past. Moreover, the meaning of the term is often used differently, as referring to

the whole community of students, as can be seen from this citation to the “Study Guidance”:

*“The objective of study guidance is to give the student the tools to integrate into the learning environment and work actively **in the learning community**, plan their studies, realize their studies according to a plan and manage their time.” (Metropolia, Study Guidance 2020).*

Second, learning communities are recognized as a desirable direction for development in the Action plan of at least one department, Metropolia Business School. According to this vision, MBS’s short-term plan is:

*“Investigating the possibility to build “organic” self-orienting learning communities (vertaistutoring), in cooperation with Trombi and tutor students” (MBS Action plan 2023, Summary).*

This also points out the stage of the initiative at the case organization, namely, *the investigation* about the possibility to build Learning communities. This indicates a very early stage, with no achievements yet in this area. Learning communities in this plan are envisaged as developed in cooperation with the student union “Trombi” and tutor students, as can be seen from Figure 14 below.

## MBS action plan 2023 SUMMARY

MBS action point	Relates to Metropolia strategic theme-s	Indicators & lead
<b>Implementation of Degree Programme plans</b> for 2023 on sustainability, digital development (re digivisio) & other fields. Sustainability inclusion in the curricula 2023 & other DP specific actions, also graduate profile/ competences in sustainability described.	<ul style="list-style-type: none"> <li>- Roadmap to sustainable solutions</li> <li>- From digileap to diverse &amp; flexible learning solutions</li> </ul>	DP plans' 2023 action points completed Degree Programme heads together with all staff
<b>People Power workshop prioritized development needs defined and taken to practice.</b> A few MBS level priorities selected from all team specific action plans, and taken to practice during the calendar year. Linked also to further establishing new team structure, competence teams, and admin staff some work reorganisation.	<ul style="list-style-type: none"> <li>- Enhancing community spirit &amp; culture</li> <li>- Enhancing quality and customer experience</li> </ul>	Selected action points for 2023 completed OAP+ other team leaders together with all staff
<b>Guidelines / concepts for different type implementations.</b> Finalising and implementing MBS pedaparvi created, quality enhancing implementation concepts for teacher use in Degree Programmes	<ul style="list-style-type: none"> <li>- Enhancing quality and customer experience</li> <li>- From digileap to diverse &amp; flexible learning solutions</li> </ul>	Concepts in active use when planning teaching Pedaparvi together with Degree Programme heads & all staff
<b>Learning communities (vertaistutoring).</b> Investigating the possibility to build “organic” self-orienting learning communities (vertaistutoring), in cooperation with Trombi and tutor students	<ul style="list-style-type: none"> <li>- Enhancing quality and customer experience</li> <li>- Enhancing community spirit &amp; culture</li> </ul>	First groups & activities taking place Degree Programme heads and study coordinators. Emphasis bachelor programmes?
<b>Improving entrance and study paths for international students.</b> Investigating and building new path and partnership possibilities for international (tuition fee) students (continuing from 22); and building a smoother service path for them; eg. developing “Digistartti” moodle space also for info & networking.	<ul style="list-style-type: none"> <li>- Ensuring economic viability</li> <li>- Enhancing quality and customer experience</li> </ul>	Number & feedback from tuition fee students. Moodle space in use. Degree Programme heads and study coordinators with all staff. For Digistartti Nea. Emphasis English speaking programmes

Metropolia

Figure 14. Learning communities as part of Action plan of the case organisation, MBS (internal document, September 2023).

In this vision, the development of Learning communities will relate to Metropolia's strategy in terms of *"Enhancing quality and customer experience"* and *"Enhancing community spirit and culture"* (both make part of "Metropolia's strategy 2021-2023"). Also, the Action plan points to some initial activities in this direction: *"first groups and activities taking place"* (meaning the Power BI Community) with support from instructors. It also suggests to pay attention to developing Learnt communities on the Bachelor's level, in addition to current efforts on the Master' level. (MBS Action plan 2023, Summary).

Third, as for the available support to the Learning community in the case organization, the staff members stress the already available resources. First of all, Metropolia provides access to *two Learning management platforms* (OMA and Moodle) where all materials can be gathered and distributed. OMA is the platform developed by Metropolia (previously TUBI), while Moodle is a vendor-managed platform. This support also includes Zoom and TEAMS environments for access to smooth and unrestricted online meetings. Secondly, Metropolia also provides facilities (such as learning spaces) for physically being on campus. Additionally, MBS management committed to acquiring a Volume MS license (this time, 30 vouchers) to award students who are ready to pass the certification as part of their learning community activities. For students, it means a very valuable, unique opportunity to try and obtain the PL-300 for "Data Analysts in Power BI" certification provided with the help of their school.

Additionally as for the support, the case organization also committed to help the Learning community via the support from its instructors: (a) via connecting to the "MS Educator" community, where Metropolia is member and thus having access for the community leader to the instructor-level support from MS; (b) the "train the trainer" type of support, which is provided by MBS instructors to the community leader and participants when needed, upon request, and (c) other type of consultative support. This support is part of a wider cooperation of the case organization with Microsoft, and it was confirmed via an interview with the dedicated MS consultant. Here is an excerpt from this interview (held on 29.3.2023):

**Respondent 1:** *We plan to launch a Learning community, how can you support our community leader? Can you give the community leader an access to MS Learn as an educator? (Respondent 1)*

**MS consultant:** *yes. She will be able to launch a course (it makes sense to do for, say, more than 10 students, not for 2-3 students) and have the key to excises. All "MS Learn" packages are free anyhow, but via "MS Learn" we can also give access*

*to free Labs with keys to exercise. I am also ready to help your community leader and do a walk-through (introduction) to "MS Learn". (Respondent 4)*

Finally, as for the hopes, expectation and limitations of the case organization, the MBS Action plan points to the hope for "*build(ing) "organic" self-orienting learning communities (vertaistutoring), in cooperation with Trombi and tutor students*" (MBS Action plan 2023, Summary).

*"There is a hope that Learning communities can quickly respond to the demand in those areas - especially related to the professional interests of the students - where students need to immediately develop a new competence/expertise/skill, but the current curricula cannot quickly suggest any relevant course. This is not a fast process to launch a new course! It takes at least one year, and often longer, to develop a course. So, we can just lag behind, if we do not suggest an alternative, easy way of responding to our students' educational needs. Moreover, Learning communities can help to address a more "niche" demands, when only a few students come together and launch a community. (In other words, this is seen as a way how to (a) quickly react to demands in the job market, and (b) do it in a student-led, student-driven manner, when students have the primary 'say' in what they need, and can take an active role in addressing these needs." (Respondent 1, Head of Programme)*

*"Additionally, via developing Learning communities, we as an education institution can give a unique opportunity to those active students who have (c) leadership and pedagogical talents. We can provide them with a great opportunity to conceive and implement own learning initiative, with the great aim to develop new skills and gain new qualifications. I think this is just great, as bright students who are very talented and, I hope, could be interested to do it". (Respondent 1, Head of Programme)*

As seen from the stakeholder views above, the hope is that Learning communities will be: (1) organized and led by the students themselves (*independent, student-driven, quickly realized*), or with the help students' representatives (and not by the instructors). Another hope is that learning communities will become (2) a new practice that will help to realize students' specific, even "niche" professional interested (*addressing the new, untouched customer needs*). The hope is also that Learning communities will become (3) widespread and independent, and as a different form of learning from the "normal" courses (*a complementary, new method of developing skills, competences, qualifications in HE*). Finally, Learning communities (4) should help talent development as an opportunity for talented students to take up a role of the Learning community leader and instructor/trainer to other students, and thus realize their unique talents in these roles (*talent management*).

#### 4.3 What hopes and expectation future participants have: Needs analysis

The needs analysis was based on the analysis of the survey (40 responses), and complemented with staff interviews (2 interviews), and discussions with participants (3 discussions) The *needs analysis* was primarily based on the entry survey of the participants, which covers their main expectations and their suggestions from the Power BI Learning Community. The survey addressed several areas, such as demographics of the future participants, interest in obtaining Power BI Data Analyst certification, motivation and expectations for the Learning Community. It revealed several important points that were necessary to take into account before starting the Learning community.

First, concerning demographics, the questions aimed to identify the existing levels of Power BI among participants to better understand their needs and plan the community's activities. The majority of participants had beginner (basic) skills, with almost 80% (35 participants). A few had zero skills, and only one other participant (in addition to the Community leader) had an intermediate level of skills.

Second, the majority of the participants (89%) were interested in *obtaining the PL-300 certification for Power BI Data Analyst*, as shown in Figure 15.

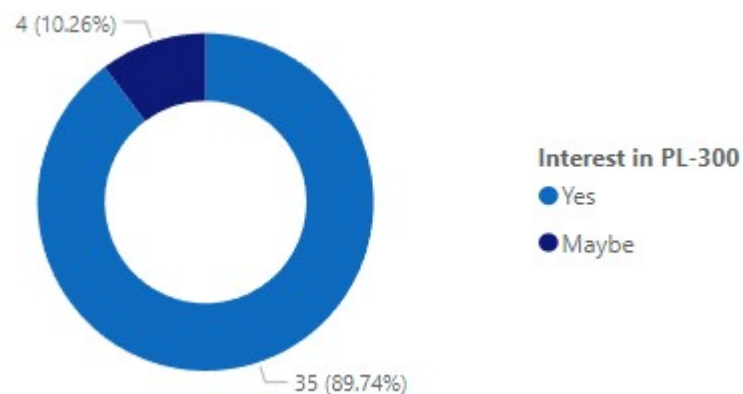


Figure 15. Interest participants in obtaining PL-300.

Third, the participants showed quite a *strong level of motivation* to learn Power BI. When describing their *reasons for the interest to Power BI*, as shown in Figure 18, the majority of participants were interested (1) in *learning more* about Power BI or *upskilling* (61% of respondents), (2) 19% needed it for their current jobs, (c) 13% were considering a career change to the analytics field or wish to enhance their skills for job prospects. These were

the three main cited motivations. As for the others, 2% are interested in the learning community for credits, and another 2% are motivated by the opportunity to prepare for certification.

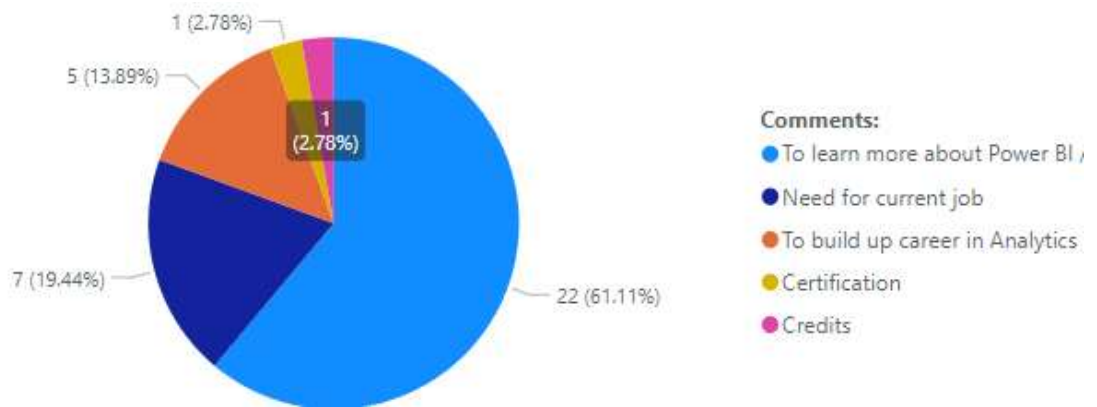


Figure 16. Participants' motivation.

Fourth, participants provided some suggestions (expectations) for the Learning community. These suggestions included:

1. Detailed guidelines and instructions for beginners. User-friendly materials and tutorials guides should be available for self-learning.
2. To learn and gain knowledge from basic to advance.
3. *"Step-by-step demos using various data sources. Ideally focus would be on ensuring that everyone has a strong understanding of the basics, rather than providing high-level visuals"*.
4. *"Would be great to have some tests and recorded lectures"*.
5. To learn practical aspects also and create full projects from start to finish.

Based on the participants' responses, the conclusion was made that the community can be supported by a leader with hands-on experience in using the Power BI tool. This support allows for running lectures and demos for students in addition to the other content that will be chosen. Moreover, the learning community can be implemented as an intensive program during the summer, with a focus on self-directed learning.

#### 4.4 Summary of Key Findings from the Starting Analysis

This section summarizes the results of the analysis pointing to the key findings identified in the investigation.

##### 4.4.1 Case Organizations: Hopes, Expectations, Limitations

First, the current state analysis reveals that, at the time of writing the thesis, there are no established learning communities within the case company.

Second, the learning communities are desirable direction for development for the case organization and part of the Action plan of Metropolia Business School. The case organization hopes that the Learning communities will be widespread and independent, organized and led by students or with some help. Moreover, the expectations that this new practice will help to realize student's needs and will provide an opportunity for talented students to take up a role of the Learning community leader and instructor/trainer to other students

Third, in terms of available resources, Metropolia provides access to two Learning management platforms (OMA and Moodle) and to learning spaces at campus. Additionally, MBS management committed to acquiring vouchers for the PL-300 certification. Lastly, the case organization asked for help to the Learning community leader via connecting to the "MS Educator" community and other type of consultive support benefiting from its connections to MS.

##### 4.4.2 Participants to the Learning Community: Hopes, Expectations, Limitations

First, the entry survey revealed that most of the participants are interested in building Power BI skills, and the majority would like to attempt obtaining PL-300 certification. Second, the majority of participants had basic Power BI skills. Third, all participants had different reasons and motivations for joining the Learning community. The main responses were to learn more about Power BI, a need for their current job, and considering a career change. Finally, the survey revealed participant suggestions, such as their expectations for detailed guidelines and instructions, recorded sessions, step-by-step demos, and some tests.

#### 4.4.3 Establishing Learning Outcomes

Based on the results from the environmental and needs analysis, it was possible to establish the following Learning outcomes for the forthcoming “Learning community of Power BI”. First, to gain *experience* and build *basic Power BI skills* that can be helpful for further learning or professional development. Second, *to achieve “PL-300 Power BI Data Analyst professional certification”*, which could be beneficial for starting a new career. Third, to encourage participants to pursue additional professional qualifications.

The next steps involve developing an Implementation Plan and Curriculum for the Learning Community, in accordance with Phases 2 and 3 of the Conceptual framework as shown in Table 13 above.

## 5 Building the Implementation Plan for the Learning Community

This section merges the results of the conceptual framework, the starting analysis, and co-creation discussions with the stakeholders (Data 2) into the Implementation plan for the Learning community.

### 5.1 Overview of the Proposal Building Stage

This sub-section presents the steps in the building of the Implementation plan for the Learning community. It contains a description of *how* the Plan building was conducted:

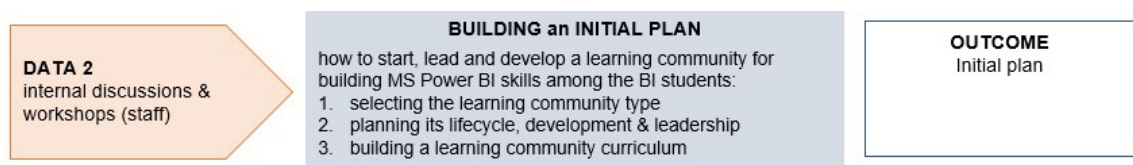


Figure 17. Initial proposal as element of the Research design.

The implementation plan was done in a systematic way, based on a) available knowledge and best practice identified in Section 3 (CF), b) findings from the starting analysis in Section 4, and c) co-creation with the key stakeholders (Data 2).

First, the plan starts with selecting the type of the Learning community suitable for the case organisation and for the participants' goal of building MS Power BI skills. In the Implementation plan, based on the existing Learning communities' types, the own definition was suggested.

Second, the Implementation plan suggests the main stages of the Learning community's lifecycle, principles, and points to a list of *possible* success factors that could potentially help to develop a strong community. The Implementation plan also anticipates the features of leadership that could potentially help to lead it.

Third, the Implementation plan suggests a Curriculum for the Learning community, which is considered a vital element of '*planning of an education ... including the definition of learning objectives*' (according to: UNESCO. IIEP Learning Portal. 2014. Terminology of European education and training policy).

The Implementation plan was shaped by Data 2 collection which consists of stakeholders' discussions (co-creation). The results of Data 2 are discussed in Section 5.2 below, with a description of stakeholders' main suggestions.

## 5.2 Findings from Data

The main inputs for the Implementation plan were: (1) CF (input from literature), as well as (2) Data 1 (from the Starting analysis), and Data 2 (from this co-creation round). The main inputs from stakeholders for the Implementation plan are shown in Table 14.

Table 14. Key stakeholder suggestions (findings of Data 2) for Proposal building in relation to findings from the Conceptual framework and Data 1.

Key focus areas	Inputs from literature (CF)	Suggestions from stakeholders for the Proposal, summary (from Data 1 & 2)	Descriptions of their suggestions (in detail)
1. Selecting the type of the Learning community	<p><b>Types of Learning Communities:</b></p> <ol style="list-style-type: none"> <li>1. Professional Learning Community (DuFour &amp; DuFour 2011, Hord &amp; Sommers 2007)</li> <li>2. Community of Practice (Wenger, 1998; McDermott &amp; M. Snyder 2002)</li> <li>3. Innovative Knowledge Community (Hakkarainen, Paavola, &amp; Lipponen 2004)</li> <li>4. Social Learning Space (Wenger, Trayner, &amp; Wenger-Trayner, 2020)</li> </ol>	The recommended type of the Learning community is the combination of the Professional Learning Community and Community of Practice, i.e. <i>the HE Learning Community</i> .	<p>1) The development of Learning communities relates to Metropolia's strategy. <i>Learning communities</i> are recognized as a desirable direction for development &amp; an opportunity to conceive and implement own learning initiative. (Respondent 3)</p> <p>2) Stakeholders supported this proposed type of the learning community. (Respondent 1)</p> <p>3) The main participant's expectations were to upskill, learn practical skills or build up a career in business analytics or data analytics. (Data 1, Entry Survey)</p>
2. Establishing, developing, and leading a Learning Community	<p>a)</p> <p><b>Stages of development:</b></p> <ol style="list-style-type: none"> <li>1. Potential</li> <li>2. Coalescing</li> <li>3. Maturing</li> <li>4. Stewardship</li> <li>5. Transformation (Wenger et al., 2002)</li> </ol>	<p>The stages of development were revised as follows:</p> <p>1) <i>Potential</i>: Define the domain, identify focus areas, and interview/survey potential participants.</p> <p>2) <i>Active</i>: Launch the community, initiate events and activities, and engage community members.</p> <p>3) <i>Dispersed</i>: The Learning community has reached its objectives. It invites new participants and looks for another leader.</p> <p>4) <i>Active (Revisited)</i>: Events and activities with a new leader.</p> <p><i>The last stage ("Transformation", in Wenger's classification) was considered not relevant as the community aims for continuity. Yet, participants are</i></p>	<p>1) The case organization supported the community leader to connect &amp; find help in the "MS Educator" community (the "train the trainer" type of support) &amp; find other type of consultative support from MS, Library available e-resources, etc. (Respondents 1 &amp; 2)</p> <p>2) The case organization hopes for a <i>continuous lifecycle</i>, so that another leader can pick it up later.</p> <p>3) The participants want to allocate a specific time period for achieving the goal. Summer time was decided to be the best period for this.</p> <p>4) The community leader has own limitations to her duties as a community leader (5-6 months she suggested as a good period; till the end of her own studies).</p>

		<p><i>welcome to re-shape the Learning community stage based on previous experience, if they find it necessary.</i></p>	<p>5) 38 participants answered that they were ready to participate in the Learning Community during the summer (Data 1, Entry survey).</p> <p>6) The routine for the community was defined as weekly meetings, self-learning via selected materials, and support from the community leader and peers. (see Appendix 1 for the full text).</p>		
<p>b)</p> <table border="1" data-bbox="412 587 607 938"> <thead> <tr> <th>Principles</th> </tr> </thead> <tbody> <tr> <td>           1.Design for evolution            2.Open a dialogue between inside and outside perspectives.            3.Invite different levels of participants.            4.Develop both public and private community spaces.            5.Focus on value.            6.Combine familiarity and excitement.            7.Create a rhythm for the community.            (Wenger et al., 2002)         </td> </tr> </tbody> </table>	Principles	1.Design for evolution 2.Open a dialogue between inside and outside perspectives. 3.Invite different levels of participants. 4.Develop both public and private community spaces. 5.Focus on value. 6.Combine familiarity and excitement. 7.Create a rhythm for the community. (Wenger et al., 2002)		<p>The principles were revised as follows:</p> <ol style="list-style-type: none"> <li>1. Design for continuation: the Learning Community is expected to improve &amp; continue after the launch.</li> <li>2. The levels: participants of all levels are welcome with the necessary digital skills (i.e. some basic digital skills to build on).</li> <li>3. The Background: <i>The participants should ideally have the same organizational background, for example, to be students at Metropolia, so that they can have access to the resources provided by the case organization (Moodle, emails, RPL, etc).</i></li> <li>4. The terms: participant should have motivation and ability for self-study.</li> <li>5. The driver: participants are driven by their desire for professional growth and/or expanding one's horizons.</li> <li>6. The value: the value for participants comes from a) building Power BI skills, b) preparing for the certification.</li> <li>7.The rhythm: weekly meetings, self-study with assignments to help students stay on track.</li> </ol>	<p>The community leader and the case organization's stakeholders derived and pre-formulated the initial principles for the LC based on the participant survey and internal discussions (Data 2), and it was decided to revise them after the first implementation.</p>
Principles					
1.Design for evolution 2.Open a dialogue between inside and outside perspectives. 3.Invite different levels of participants. 4.Develop both public and private community spaces. 5.Focus on value. 6.Combine familiarity and excitement. 7.Create a rhythm for the community. (Wenger et al., 2002)					
<p>c) Success factors</p>		<p>The success factors were revised as follows:</p> <ol style="list-style-type: none"> <li>1. The cause: it comes from passion or interest in building Power BI skills.</li> <li>2. The objectives: to master "Power BI" skills in a facilitated way, and ideally, get a certification. For some, switch to a Business Analyst career.</li> </ol>	<ol style="list-style-type: none"> <li>1) The stakeholders decided to re-shape the sequence &amp; emphasize the part called "Success factors", compared to other elements (principles, etc).</li> <li>2) 35 students expressed interest in obtaining PL-300 Power BI Data Analyst Certification.</li> <li>3) MBS management committed to purchasing vouchers to award students who are ready to pass the</li> </ol>		

	<table border="1"> <thead> <tr> <th data-bbox="439 331 685 379">Success factors</th> </tr> </thead> <tbody> <tr> <td data-bbox="439 379 685 730">           1.Cause            2.Objectives            3.Sponsorship            4.Leadership            5. Environment            6.Conditions            7.Content            8.Contribution            9.Credit            10.Results            (Borzillo, 2007)            (Lancaster, 2020)         </td> </tr> </tbody> </table>	Success factors	1.Cause 2.Objectives 3.Sponsorship 4.Leadership 5. Environment 6.Conditions 7.Content 8.Contribution 9.Credit 10.Results (Borzillo, 2007) (Lancaster, 2020)	<p>3. The sponsorship: the case organization is the sponsor, via providing support &amp; resources.</p> <p>4. The leadership: the Learning community will be supported by an experienced Master's student who has hands-on experience with Power BI.</p> <p>5. The environment: should be risk-free and is built on trust and respect.</p> <p>6. The conditions: self-study materials, live meetings, Q&amp;A, support from the community leader and peers, free vouchers for the certification.</p> <p>7. The content: It will consists of MS Learning packages, additional materials, and recordings from the meetings.</p> <p>8. The contribution: guidance by the community leader, a Master's student, who has hands-on experience in Power BI and will contribute to the community.</p> <p>9. Credit: the new professional certification (if gained) in PL-300 vouchers and, based on it, RPL for 5 ECTS as an elective course.</p> <p>10. Measurable results: the certification itself, the certification scores (700 points to pass), the pre-exam (0-100%), the tasks (e.g. in Labs &amp; exercises), and feedbacks.</p>	<p>certification as part of their learning community activities (based on 80% of pre-exam result). Also, the case organization supports with other resources, e.g. access to other contents, such as oreilly.com, Moodle, etc.</p> <p>3) The participants' expectations to the conditions and the content of the Learning community include e.g.:</p> <p><i>"Step-by-step demos using various data sources."</i></p> <p><i>"User-friendly materials and tutorials guides should be available for self-learning."</i></p>
Success factors					
1.Cause 2.Objectives 3.Sponsorship 4.Leadership 5. Environment 6.Conditions 7.Content 8.Contribution 9.Credit 10.Results (Borzillo, 2007) (Lancaster, 2020)					

3. Designing curriculum	<p>3. Curriculum design</p> <hr/> <p><b>Phase 1. Information Gathering – Establishing Learning Outcomes</b></p> <p>a) Principals b) Environmental Analysis c) Needs Analysis</p> <p><b>Phase 2. Evaluation</b></p> <p><b>Phase 3. Design and Piloting</b></p> <p>a) Assessment b) Format c) Content &amp; Sequencing (Thornton 2012)</p> <p><b>Additional considerations</b> Learning vs. self-learning (Premlatha et al., 2015) and Learning diaries as a tool (Kivimäki et al (2021))</p>	<p>Phase 1. This part was done at the Stating analysis stage.</p> <p>Part 2. The Community leader evaluated all available materials and selected the most relevant ones.</p> <p>Phase 3. Design &amp; Piloting:</p> <p>a) Assessment: via learning diaries, tasks, pre-exam test. b) Format: live-guided meetings, self-study with provided materials, forum on Moodle, personal support if needed. c) Content &amp; Sequencing: six learning paths consisting of modules, labs, additional materials (extra courses, articles, books, videos etc.) supported with 5 live-guided meetings. d) Role of Learning vs. self-learning: 5 live-guided meetings with instructions and the rest is self-learning. e) Learning diaries as a tool: to reflect on self-learning and own achievements vs. difficulties faced during the Learning community.</p>	<p>1) Stakeholders suggested to get all possible support from the “MS Educator” community &amp; the “MS Learn” free packages for Power BI (for defining the Curriculum).</p> <p>2) Support also suggested to look for any possible additional materials from outside (open access, Metropolia’s library, etc), and select the best self-learning materials out of them, in order to add to the curriculum.</p> <p>3) In Curriculum design, the stakeholders wishes the community leader to be brave and rely on own experience and industry needs &amp; yet, listen to the participants along the way!</p>
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As seen from Table 14, the stakeholders provided multiple suggestion that shaped the contents of the Implementation plan. There were both, wishes and hopes, as well as very concrete and practice suggestions. If summarized, the key suggestions included.

First of all, the development of Learning communities relates to Metropolia's strategy in terms of *"Enhancing quality and customer experience"* and *"Enhancing community spirit and culture"*. The stakeholders of the case company hope *"that Learning communities can quickly respond to the demand in those areas - especially related to the professional interests of the students - where students need to immediately develop a new competence/expertise/skill, but the current curricula cannot quickly suggest any relevant course."* (Respondent 1). Secondly, Metropolia committed to helping the Learning community via the support from its instructors via connecting to the "MS Educator" community and other type of consultive support. Additionally, the case organisation is committed to acquiring a "Volume MS license" (30 vouchers). Moreover, it was emphasized that via developing the Learning community, the case organization provides *"a unique opportunity to those active students who have leadership and pedagogical talents" "to conceive and implement own learning initiative, with the great aim to develop new skills and gain new qualifications"*. (Respondent 1).

Other suggestions are related to concrete practicalities for establishing, developing and leading the Learning community, and its curriculum design. Based on these inputs, the actual Implementation plan was drafted, as reported in the next Section.

### 5.3 Implementation Plan

This section describes each element of the Implementation Plan. Importantly, the Plan goes point by point along all the elements discussed in Table 14 (according to the numbering in its first column, since it was guided by the CF structure).

#### 5.3.1 Element 1: Type for the Learning Community

**Point 1.** Name of the learning community: *"The Learning Community of Power BI"*.

**Point 2.** Type of the Learning community: *The HE Learning community.*

**Point 3.** Definition of this type of the Learning community (a working definition formulated by the thesis researcher based on all the previous inputs, CF and Data 1-2): *The HE Learning community is a group of HE students who share an interest or passion in the same topic and aim to learn, enhance their current skills, or build new knowledge, so that to aid in own professional development.*

**Rationale:** The starting point for selecting the Learning community type was the Conceptual framework, revised based on the case organizations and participant's' expectations. The stakeholders, participants and the community leader drew inspiration from this start. Based on the discussions with the stakeholders, the HE Learning community type was selected as follows.

The idea of the Learning Community in the case organization is to develop professional skills that could be help participants to advance their career development. However, the definition of *the Professional Learning Community* differs from these goals, since it focuses on 'a never-ending process in which *educators* commit to working together to ensure *higher levels of learning for every student*' (DuFour et al., 2016, p. 5). Since the "Learning Community of Power BI" is a group of people interested in developing their Power BI skills, and they are not professional educators, this type was rejected.

Similarly, *the Innovative Knowledge Community* is supposed to create innovative knowledge, while the *Social Learning Spaces* do not represent a group/community of people. Thus, these types were also rejected. The *Community of Practice* seemed closer to the objectives of the community. It is defined as "groups of people who share concerns, a set of problem, or a passion about the topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis." (Wenger et al., 2002, p. 4). In the end, it was considered best to combine the two existing types of Learning Communities: *Professional Learning Community* and *Community of Practice* into a new, own type, *the HE Learning community*, that would address the objective best.

Therefore, own type of the Learning community was proposed: *the Higher Education (HE) Learning community*, which gathers HE students with a passion and interest in the same topic. To join the HE Community, it is enough to be a motivated student and wish to learn new skills in a community of like-minded participants. Also, since the participants expressed a clear wish to be guided (facilitated) in this learning journey, this type of the Learning community needed a leader. The Community leader should have a higher level

of competence in this specific area, so that to help the community participants achieve their goals, providing support, and maintaining and developing the community.

### 5.3.2 Element 2: Lifecycle, Development & Leadership of the Learning Community

Importantly, the stakeholders decided to somewhat re-shape the sequence & emphasize the part called “Success factors” in CF, since it outlined the key elements of the Learning community. Therefore, it was decided to be placed before (a) Principles and (b) Stages.

**Point 4.** “Success factors”:

**Point 4-1.** Cause (or domain): *the cause comes from passion or interest in building Power BI skills.*

**Point 4-2.** Objectives: *for most of the participants, to master Power BI skills in a facilitated way; ideally, obtain a “PL-300 Power BI Data Analyst” certification. For some, build a career in Business or Data Analytics.*

**Point 4-3.** Sponsorship: *The case organization is the sponsor, via providing support & resources (e.g. vouchers for PL-300 Power BI Data Analyst certification).*

**Point 4-4.** Leadership: *The Learning community is led by a Master’s student who has professional experience as a web analyst and had first-hand experience with Power BI..*

**Point 4-5.** Environment: *The Learning community's environment is risk-free and is built on trust and respect, so everyone can speak-up.*

**Point 4-6.** Conditions: *The Learning community includes self-study materials, five live-guided meetings and Q&A, support from the community leader and peers, and free vouchers for the certification exam.*

**Point 4-7.** Content: *It consists of Microsoft Learning packages (learning paths, modules, labs), articles, courses on oreilly.com, YouTube videos, additional open Microsoft materials that haven’t been included in Microsoft packages, and recordings from the live meetings.*

**Point 4-8.** Contribution. *The Learning community is guided by a Master's student from Metropolia with hands-on Power BI experience. At the same time, the community leader draws from support of other experienced students who are encouraged to contribute with own inputs.*

**Point 4-9.** Credit. *The Learning community prepares to take the certification for "PL-300 Power BI Data Analyst" professional certification (the main credit) and, if passed, to earn 5 ECTS via RPL in an elective course.*

**Point 4-10.** Measurable results. *The Learning Community's results can be demonstrated through the certification itself, its score (700 points to pass), the pre-exam (0-100%), the tasks (e.g. in Labs & exercises), and feedbacks.*

**Rationale:** The starting point for the development was the Conceptual framework, revised based on the case organizations and participant's' expectations. The stakeholders, participants and the community leader drew inspiration from this start. Based on the discussions with the stakeholders, the 10 "success factors" were prioritized over other elements, due to being very concrete and relevant, and drafted first.

Especially important was the significance of leadership in the community. As mentioned earlier in Section 2, Donaldson (2020) concludes that the design of the learning community should involve identifying and selecting core leaders '*who will take on responsibilities for facilitating various levels of engagement, collaborative efforts, and development of strategies and processes toward community growth and impact*' (Donaldson, 2020, Community features).

**Point 5.** "Principles":

**Point 5-1.** Design for continuation. *The Learning community hopes to continue after its launch: to start in small steps, improve, grow and evolve from experience.*

**Point 5-2.** The Levels: *The Learning community invites all levels of participants from "0" to professional. However, participants are expected to have some necessary digital skills (i.e. some basic digital skills to build on).*

**Point 5-3.** The Background: *The participants should ideally have the same organizational background, for example, to be students at Metropolia, so that they can have access to the resources provided by the case organization (Moodle, emails, RPL, etc).*

**Point 5-4.** The Terms: *The Learning community's participants should have motivation to learn and the ability for self-study.*

**Point 5-5.** The Driver: *Professional growth and/or expanding horizons. The Learning community is designed to help students learn new skills that are helpful for their professional growth. The participants are driven by their desire for professional growth and/or expanding one's horizons.*

**Point 5-6.** The Value. *Based on the participants' responses, value comes from building Power BI skills and preparing for the certification.*

**Point 5-7.** The Rhythm: *The rhythm includes five live-guided meetings (every Friday) and doing "light" homeworks (assignments with deadlines), which help students to stay on track.*

**Rationale:** The starting point for the development was the Conceptual framework, revised based on the case organizations and participant's' expectations. The stakeholders, participants and the community leader drew inspiration from this start. Based on the discussions with the stakeholders, the 7 revised "principles" listed above were drafted next.

It became clear from discussions that "Principles" from the conceptual framework should be revised. Therefore, some new principles were proposed for the Power BI Learning Community, such as *the Background, Motivation and the ability for self-study*, and *professional growth as the Driver*. It was decided that the community would emphasize only some of the principles based on Wenger's theory, especially *the Value* and *Rhythm*. As for the Value, the initial idea was to help prepare for the PL-300 Power BI Data Analyst certification. But the starting analysis showed that additional value for the participants also comes from learning the fundamentals of Power BI as a tool. As for the Rhythm, it was planned in the following way.

First, it was proposed to have a timetable of the Learning community during the summer when students have some free time. It was decided to have five meetings (similar to a “normal” course) during June - July 2023, when most of the university’s courses are over. The frequency of the meetings was planned as 5 times, on every Friday, in the morning time (so that to continue the normal routine of the BI Master’s students who study on Fridays). The approximate length of each session was set 1,5 – 2 hours, so that to fit the content guidance and questions.

Second, it was decided to use Moodle as the learning platform since it would allow for gathering and structuring of all materials in sections, i.e. better visibility, and with a forum for discussions. It was also decided to meet online through Zoom, as most of the students study in online programs and don't have much time to visit the campus. Therefore, online format was selected the most relevant and convenient for the participants.

**Point 6.** “Stages of development”:

**Point 6-1.** Potential: Define the domain, identify focus areas, and interview/survey potential participants. *The Learning Community ran a survey to understand potential participants' expectations and motivations and asked them for pre-registration.*

**Point 6-2.** Active: Launch the community, initiate events and activities, and engage community members. *The Learning Community held the first meetings with all participants. This meeting covered instructions, schedules for future meetings, the first lecture, and a Q&A session. The whole first iteration was planned to consist of five meetings during two months, June-July 2023.*

**Point 6-3.** Dispersed: *The Learning community has reached the objectives for this iteration. It invites new participants and looks for another leader.*

**Point 6-4.** Active (Revisited): *Events and activities with a new leader.*

**Point 6-5.** Transformation. *Not relevant as the community aims to have a continuous lifecycle. The last stage (“Transformation”, in Wenger’s classification) was considered not relevant as the community aims for continuity. Yet, participants are welcome to re-shape the Learning community stage based on previous experience, if they find it necessary.*

**Rationale:** The starting point for the development was the Conceptual framework, revised based on the case organizations and participant's' expectations. Based on the discussions with the stakeholders, the four main stages were proposed: potential, active, dispersed, and revised, i.e. the next round of the active stage.

### 5.3.3 Element 3: The Learning Community Curriculum

#### **Point 7.** "Designing Curriculum"

**Point 7-1.** Information gathering (environmental analysis, needs analysis): *completed earlier, in CSA.*

**Point 7-2.** Evaluation. *The Community leader evaluated multiple available materials, namely: the content of the recommended "MS Learning packages" (learning paths, modules, and labs), additional materials such as articles, available courses (e.g. oreilly.com with access via Metropolia credentials), open access YouTube videos, etc.*

**Point 7-3.** Design and piloting. *The Learning Community will have three main parts: assessment, format, and content. The elements of assessment include learning diaries and pre-exam tests. The format of the content includes materials on the Moodle platform, live-guided meetings, a forum, and personalized support. The content consists of MS Learning packages and additional materials.*

**Point 7-4.** Additional considerations. *The Learning Community will utilize learning diaries as a self-reflection tool and will use materials suitable for self-learning to organize a continuous lifecycle for the community.*

**Rationale:** The starting point for the development was the Conceptual framework, creatively changed based on the inputs from the stakeholders. Based on the development discussions with the stakeholders, the following course of actions was selected for the Curriculum design.

Importantly, in "Curriculum design" only includes *Phases 2, 3 and additional considerations*. Point 1 was already implemented earlier in the Starting analysis.

3. Curriculum design
<p><b>Phase 1. Information Gathering – Establishing Learning Outcomes</b></p> <p>a) Principals b) Environmental Analysis c) Needs Analysis</p> <p><b>Phase 2. Evaluation</b></p> <p><b>Phase 3. Design and Piloting</b></p> <p>a) Assessment b) Format c) Content &amp; Sequencing (Thornton 2012)</p> <p><b>Additional considerations</b> Learning vs. self-learning (Premlatha et al., 2015) and Learning diaries as a tool (Kivimäki et al (2021))</p>

First, **Evaluation** of the content consisted of analyzing the learning paths and labs provided by Microsoft as free materials that can be helpful in preparing for the PL-300 Power BI Data Analyst Certification. All learning paths and labs went through a rigorous review and testing to identify potential challenges the participants might face. Some topics within the MS Learning paths were only briefly covered, leading to the decision to use additional materials. These supplementary materials were sourced from suggestions by the case organization and own discoveries made by the community leader. Moreover, to enhance user experience, specific instructions related to labs were prepared, ensuring a more user-friendly and smoother learning experience.

As for **Design and Piloting**, first, *the Assessment* as such was not in the focus of the Learning Community, but it still contained some elements of assessment. For example, *learning diaries* served for reflection on self-learning and the achievements vs. difficulties faced during the Learning Community; *the pre-exam test* was assessed on a pass/fail basis, with a recommended score of 80% (for getting a free voucher for the exam). To receive a voucher, it was agreed that participants must complete all learning diaries and submit screenshots of three attempts at the pre-exam test with their achieved scores.

Second, *the Format* of the content was aimed at self-study, by using the recommended materials gathered on the Moodle platform. The materials also planned to include live-guided meetings (and their recordings), a forum for peer support, and, if needed, more personalized support during the learning community period.

Third, *the Content and sequencing* were organized into six main Learning paths. Each learning path included modules and labs. In addition to the “MS Learning packages”, there were also other materials available: e.g. “Power BI” courses from oreilly.com, relevant publications (articles, blogs, etc.), open access YouTube videos, and additional MS videos and resources not included in the PL-300 package, etc. The main topics planned to be focused on for working with Power BI include preparing the data, modelling the data, visualizing and analyzing the data, deploying, and maintaining assets. These skills are also assessed in the PL-300 Microsoft certification.

Fourth, as for *the Additional considerations* for the curriculum included structured materials for self-learning and learning diaries as a tool for self-reflection, as already touched upon earlier. (The curriculum design can be found in more detail in Appendix 4). The full framework of “MS Learning packages” is shown in Table 15.

Table 15. The Framework of 6 learning paths by MS.

Learning Path	Module	Link
Learning Path 1: Get started with Microsoft data analytics	Module 1: Discover data analysis Module 2: Get started building with Power BI	<a href="https://learn.microsoft.com/en-us/training/paths/data-analytics-microsoft/">https://learn.microsoft.com/en-us/training/paths/data-analytics-microsoft/</a>
Learning Path 2: Prepare data for analysis	Module 1: Get data in Power BI Module 2: Clean, transform, and load data in Power BI	<a href="https://learn.microsoft.com/en-us/training/paths/prepare-data-power-bi/">https://learn.microsoft.com/en-us/training/paths/prepare-data-power-bi/</a>
Learning Path 3: Model data in Power BI	Module 1: Design a data model in Power BI Module 2: Introduction to creating measures using DAX in Power BI Module 3: Optimize a model for performance in Power BI	<a href="https://learn.microsoft.com/en-us/training/paths/model-power-bi/">https://learn.microsoft.com/en-us/training/paths/model-power-bi/</a>
Learning Path 4: Visualize data in Power BI	Module 1: Work with Power BI visuals Module 2: Create a data-driven story with Power BI reports Module 3: Create dashboards in Power BI Module 4: Create paginated reports	<a href="https://learn.microsoft.com/en-us/training/paths/visualize-data-power-bi/">https://learn.microsoft.com/en-us/training/paths/visualize-data-power-bi/</a>
Learning Path 5: Data analysis in Power BI	Module 1: Perform analytics in Power BI Module 2: Work with AI visuals in Power BI	<a href="https://learn.microsoft.com/en-us/training/paths/perform-analytics-power-bi/">https://learn.microsoft.com/en-us/training/paths/perform-analytics-power-bi/</a>
Learning Path 6: Manage workspaces and datasets in Power BI	Module 1: Create and manage workspaces in Power BI Module 2: Manage datasets in Power BI Module 3: Implement row-level security	<a href="https://learn.microsoft.com/en-us/training/paths/manage-workspaces-datasets-power-bi/">https://learn.microsoft.com/en-us/training/paths/manage-workspaces-datasets-power-bi/</a>

This framework was evaluated by the Community leader and re-designed from 6 packages into 5 live-guided meetings, scheduled in advance, as shown in Table 16.

Table 16. Framework for Learning Community for Business Informatics Students.

Lesson	Topics	Description
1. Get started with Microsoft data analytics	Categories of analytics (descriptive, diagnostic etc.) Different roles in Data (Business	Self-study of Learning path 1 by MS

	analyst, Data analyst etc.) and their tasks. Parts of Power BI (Desktop, Service and Mobile App). Building blocks of Power BI (dashboards, reports, visualizations, tiles etc.)	
2. Getting and preparing data in Power BI	Getting data in Power BI from different sources. Change data source setting. Types of storage modes. Power Query tricks (cleaning, transforming data & merge vs append queries)	Self-study of Learning path 2 by MS + 1 meeting
3. Designing and developing a data model	Dimensions and facts tables. Table's relationships. Hierarchies, DAX. Optimize model performance.	Self-study of Learning path 3 by MS + 1 meeting
4. Visualize data	Types of visualizations. Report design. Buttons, bookmarks and selections. Slicers, filters, and sorting. Publish reports. Dashboards. Paginated reports.	Self-study of Learning path 4 by MS + 1 meeting
5. Data analysis in Power BI & Manage workspaces	Statistical functions. Identifying outliers. Clustering techniques. Time series analysis. Q&A feature.  &  Workspaces. Data protection. What-if parameters. Gateway. Scheduled refresh. Row-level security (RLS)	Self-study of Learning path 5 and Learning path 6 by MS + 1 meeting
6. Pre-Exam Test (self-study, done individually)	50 questions	Self-study + 1 meeting (discussion)

The next section reports on the implementation results.

## 6 Implementation of "Learning Community of Power BI"

This section reports on the results of the implementation of the Learning community in summer 2023. At the end of this section, the Implementation plan (revised) is summarized and presented.

### 6.1 Overview of the Implementation Stage

The Learning Community of Power BI was implemented from June to August 2023. As planned, it consisted of five morning meetings, with each session approximately lasting 1.5 to 2 hours. In addition, the sixth session was organized, for guidance before taking the Certification exam. A total of 35 participants registered in Moodle, and 20 to 25 students attended the online meetings. In total, 14 participants submitted all learning diaries and completed the pre-exam practical test with the results above 80% (as required for the getting the voucher). The final survey was filled out by 8 participants.

Table 17. Calendar of "The Learning community of Power BI".

Sessions, dates	Topics	Comments
Session 1, 2 June 2023	Instructions to Moodle, labs and learning paths. Getting data, cleaning and transforming data in Power BI. Q&A.	25 attendances.
Session 2, 8 June 2023	Designing, developing a data model. Dimension tables vs Fact tables. Star schema and table's relationships. Creating measures using DAX vs quick measures. Date table. Hierarchies. Calculated and custom columns. Q&A.	17 attendances.
Session 3, 16 June 2023	Types of Visualizations and it's formatting. Filters vs Slicers. Bookmarks, buttons, tooltips, drill through. Lock visualizations. Sync slicers and edit its interactions. Themes. Q&A.	20 attendances
Session 4, 30 June 2023	Forecasting. Power BI Service. Workspaces. Dashboards vs Reports. Apps. Gateways. Group data. Paginated reports. Q&A.	20 attendances.
Session 5, 7 July 2023	Discussions about the pre-exam test. PL-300 Data Analyst test information.	20 attendances.

Session 6, for preparing and basics of the Certification Exam (based on first positive results)	Discussion and sharing experience about successful pass of the PL-300 Power BI Data Analyst Certification.	30 attendancies
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The Revised plan also included further development suggestions to the “Power BI” curriculum as it is *‘the key to improving practice’* (Lancaster, 2020, p. 187).

## 6.2 Feedback & Results Based on Data 3

The report on the results is based on Data 3 that consists of feedback to the Learning community and some KPIs (measurable results, such as certifications and pre-exams passed). Additionally, Data 3 includes a log diary with observations of the community leader, internal interviews, discussions with participants conducted online by Zoom and email, and student’s learning diaries. A total of 8 students participated in providing final feedback. Table 18 below summarizes the results from their responses.

First, as for *the feedback* the “MS Learning paths” and labs provided by Microsoft for the PL-300 Power BI Data Analyst Certification.

*The MS Learning packages* received contradictory feedback: some students were very satisfied with the materials, considering it as the best source of learning, while others rated them as the worst resource for studying. Based on the feedback results, some respondents mentioned that the package is quite extensive, and limited time may not be sufficient to complete it properly. That’s why some students return to it after the learning community and spend more time going through the materials. One of the interviewees mentioned that *“the Learning community package is even heavier than a typical course at Metropolia”*.

*The Microsoft labs* got similar feedbacks as the learning paths. Some students were pleased and excited with them, they found the instructions clear and the exercises useful. While others encountered problems with login and other technical issues, leading to their disappointment.

The overall feedback to “the Learning Community of Power BI” mentioned that the level of the materials was quite challenging for some participants. It was noticed that the

Learning community is a great start, but it would be nice to have something similar for a longer time and for real beginners. At the same time, some participants emphasized that the contents included only basic, fundamental learning, and after that their plan is to continue learning at a more advanced level.

As for the feedback to other organizational points, it related to vouchers and grading in order to get a free voucher. The participants trained via assignments, did at least three rounds of pre-exam tests, and reflected on their learning diaries in own learning diaries. If the pre-exam were passed, the participants gained a free voucher to the exam. In summer 2023, 14 participants got a free voucher. By the time of writing this thesis, 3 participants passed the certification (and reported back to the community), 2 failed, 5 reported that they will use additional time before taking the Certification exam, and the others did not report back to the community. Those who passed successfully and acquired a certificate, were able to get a RPL (Recognition of Prior Learning) for 5 ECTS as an elective course. However, there was a wish from the students who failed that their effort would also somehow be assessed and some credits gained. This wish was not, however, realized in this round of implementation.

Table 18. Summary of key points from the participants' feedback (findings of Data 3) for the implementation of the "Learning community of Power BI".

№	Feedback	Action point (further development)
1	Most of the students who responded to the questionnaire were happy with online meetings as it was easier to learn in a guided environment. However, some of the participants mentioned that face-to-face meeting would be nice to have as well, as they can bring more communication and discussions.	To organize some f2f meetings so participants can get to know each other. The idea of a learning community is to help each other and share experiences, so trust needs to be built. F2f meetings can facilitate this better than just online meetings.
2	All respondents were happy about atmosphere during the learning community. <i>"Atmosphere was positive and supportive."</i>	No action points.
3	About the course arrangements: <i>"A well arranged course with clear schedules and instructions."</i> <i>"Teaching, examples, lots of materials were good when you have time to go through."</i>	No action points.
4	Most of the respondents were satisfied with planning of the Learning Community.	No action points.

	<p><i>"Meetings were arranged and planned very well."</i></p> <p><i>"Very well-planned program and Learning materials."</i></p>	
5	The average result of meeting participants expectations is 91,6%.	No action points.
6	<p>However, based on the answers on questionnaire, it is obvious that most of the respondents needed <b>more time</b> than was allocated.</p> <p><i>"Some topics to be presented in some lower pace".</i></p> <p><i>"The schedule was quite tight."</i></p> <p><i>"I feel the need for additional independent study regarding extra materials."</i></p>	To cover the topic of building Power BI skills, the participants should have more time for learning, getting accounted with the materials, and mastering the skills.
7	<p>Feedback to "MS Learning packages":</p> <p><i>"The Learning community package is even heavier than a typical course at Metropolia".</i></p> <p><i>"The package is huge so more time and more practical exercises."</i></p>	To cover the topic, the participants should have more time & ideally, more exercises and support from live-guided meetings.
8	<p>Feedback to "MS labs":</p> <p><i>"Some issues with MS labs.</i></p> <p><i>"Login and saving labs".</i></p>	It is necessary to connect with the MS Educators team and provide feedback to MS. The Community leader is not able to influence the MS Labs. It is necessary to check what might have been done to resolve these issues on their side.
9	<p>Suggestions for improvement:</p> <p><i>"Course was great, no improvements. But good to have the same course meant for beginners."</i></p>	1. It is necessary to organise an additional section in Moodle with the course materials targeted at the beginners. After such preparation, the participants can move to the Learning paths and prepare for the certification.
10	<p>Suggestions for improvement:</p> <p><i>"Maybe engaging students more in the community. For example, students having their own examples that need to be handled (e.g. preparing the data) or best visualizations tips for certain data type".</i></p> <p><i>"Use the tool for one or more realistic projects from beginning to end. Possible solution may be recorded for students to learn from"</i></p> <p><i>"It is better to include practical sessions also".</i></p>	<p>2. It is necessary to offer a project for participants, so they can practice and use the tool for creating the report and dashboard from the scratch.</p> <p>3. The project should ideally be support by some practical, hands-on, live-guided sessions.</p>

Additionally, the final feedback revealed that *50% of participants* achieved a good basic level of Power BI, with 25% gaining a deeper understanding of creating visualizations. However, skills and knowledge development were lower in DAX (42% of respondents) and AI functions and visualization (14%). Half of the respondents reported achieving their intended outcomes, while others are awaiting certification results. Moreover, the majority of respondents (6 people) expressed their intent to continue learning. The following tables includes the average on different types of satisfaction.

Table 19. LC participants' feedback: Evaluation of assess.

<b>Evaluations of access</b>	<b>Average</b>
Access to the contents of the MS learning packages (on the scale 1-5):	4.75
Access to the labs (on the scale 1-5):	4.25
Access to the additional materials e.g., O'Reilly course and selected videos (on the scale 1-5):	4.71
Access to the online meeting with the community leader Anna (on the scale 1-5):	5
Access the inputs from the community leader Anna (on the scale 1-5):	5
Access support from the Learning Community participants (on the scale 1-5)	3.62
Have you found and used any own materials? Was it difficult to get access to these materials that you have found useful? (on the scale 1-5):	2.28

Based on the survey results, the highest marks were given to access to online meetings with the community leader and inputs from the community leader. The lowest average score was attributed to the access to support from the Learning community participants and access to personal materials.

Table 20. LC participants' feedback: Evaluations of training contents.

<b>Evaluations of training contents</b>	<b>Average</b>
Training contents of the MS learning packages were engaging and useful for me to develop Power BI skills (on the scale 1-5)	4.37

Training contents of the labs were engaging and useful for me to develop Power BI skills (on the scale 1-5)	4.62
Training contents of the additional materials (e.g. O'Reilly course and videos) were engaging and useful for me to develop Power BI skills (on the scale 1-5)	3.87
Training contents of the online meetings with the community leader Anna were engaging and useful for me to develop Power BI skills (on the scale 1-5)	4.87
Inputs from the community leader Anna were engaging and useful for me to develop Power BI skills (on the scale 1-5)	4.87
Support from the learning community participants were engaging and useful for me to develop Power BI skills (on the scale 1-5)	3.5
In case you found and used any own materials, evaluate their training contents (on the scale 1-5)	3.33

The highest mark was given to the online meetings and labs. The lowest marks were assigned to personal materials, making them challenging to find (e.g., suitable training in DAX for beginners or paid courses on Udemy). Support from the Learning community ranked among the lowest, possibly due to the insufficient time spent together in online sessions. Additionally, some participants mentioned a lack of time to utilize additional materials.

Table 21. LC participants' feedback: Evaluations of own learning.

<b>Evaluations of own learning</b>	<b>Average</b>
I have learnt from MS learning packages (in xx %, out of the whole 100%)	23
I have learnt from the labs (in xx %, out of the whole 100%)	25
I have learnt from the additional materials, e.g. O'Reilly course and selected videos (in xx %, out of the whole 100%)	6
I have learnt from the online meetings with the community leader Anna (in xx %, out of the whole 100%)	23
I have learnt from the inputs from the community leader Anna, e.g. via comments, emails, sharing etc (in xx %, out of the whole 100%)	11

I have learnt from support from the Learning Community participants e.g. via comments, emails, sharing etc (in xx %, out of the whole 100%)	6
I have learnt from my own materials that I have found and used (in xx %, out of the whole 100%)	6

Based on the data gathered from the final feedback, it is evident that the responses are contradictory. Although most of the participants started with a similar level of knowledge, opinions after participating in the Learning Community divided. Some participants found it to be a great starting point for basic knowledge, while others felt it hardcore. Satisfaction with MS Learning paths and labs, as well as additional materials, varied. Therefore, the calculation of the average indicated an overall satisfaction level among participants as presented in Table 21. Finally, the feedback on the Learning Community was summarized in the SWOT table shown below.

Table 22. SWOT analysis of the Learning community implementation.

<p><b>Strengths</b></p> <p>Learning packages are a nice possible solution for learning the fundamentals of Power BI and preparing for PL-300.</p> <p>The learning community is a great starting point for Power BI.</p> <p>Online meetings with the leader were well-organized and helpful for students.</p> <p>Metropolia provided free vouchers for the PL-300 certification.</p>	<p><b>Weakness</b></p> <p>There wasn't enough time to fully grasp the learning package. The learning community was intensive for most of the students.</p> <p>There was a lack of interaction between participants.</p> <p>DAX remained unclear for most participants even after the Learning Community.</p> <p>Microsoft's labs are useful but sometimes glitchy. Participants may need more practical examples; labs alone might not be sufficient.</p> <p>Learning paths may not suit everyone; videos could be more helpful. However, providing free videos might not be ideal for the university.</p>
<p><b>Opportunities</b></p> <p>The ability to prepare for the PL-300 certification.</p> <p>The ability to develop fundamental Power BI skills.</p>	<p><b>Threats</b></p> <p>There is no budget for preparing videos or buy an additional paid course that will complement the learning paths by MS.</p> <p>Leader support is necessary for addressing technical issues, working on labs, and more.</p> <p>There is less motivation without the availability of free vouchers.</p> <p>Meetings support the learning community. The community needs a leader.</p>

### 6.3 Implementation Plan (Revised) Based on Data

This sub-section includes the revised Implementation plan for use in the future.

Table 23. Implementation plan (revised) of the Learning Community of Power BI.

Implementation plan (revised)	Comments
Element 1. Type of the learning community	
<p><b>Point 1.</b> Name of the learning community: <i>“The Learning Community of Power BI”</i>.</p> <p><b>Point 2.</b> Type of the Learning community: <i>the HE Learning community</i></p> <p><b>Point 3.</b> Definition of this type of the Learning community: <i>The HE Learning community is a group of HE students who share an interest or passion in the same topic and aim to learn, enhance their current skills, or build new knowledge, so that to aid in own professional development.</i></p>	<p>The self-defined type of the learning community was confirmed &amp; will stay.</p>
Element 2. Establishing, developing, and leading a Learning Community	
<p><b>Point 4.</b> Success factors:</p> <ol style="list-style-type: none"> <li>1. The cause: it comes from passion or interest in building Power BI skills.</li> <li>2. The objectives: to master “Power BI” skills in a facilitated way, and ideally, get a certification. For some, switch to a Business Analyst career.</li> <li>3. The sponsorship: the case organization is the sponsor, via providing support &amp; resources.</li> <li>4. The leadership: the Learning community will be supported by an experienced Master’s student who has hands-on experience with Power BI.</li> <li>5. The environment: should be risk-free and is built on trust and respect.</li> <li>6. The conditions: self-study materials, live meetings, Q&amp;A, support from the community leader and peers, free vouchers for the certification.</li> <li>7. The content: It will consists of MS Learning packages, additional materials, and recordings from the meetings.</li> <li>8. The contribution: guidance by the community leader, a Master's student, who has hands-on experience in Power BI and will contribute to the community.</li> <li>9. Credit: the new professional certification (if gained) in PL-300 vouchers and, based on it, RPL for 5 ECTS as an elective course.</li> <li>10. Measurable results: the certification itself, the certification scores (700 points to pass), the pre-exam (0-100%), the tasks (e.g. in Labs &amp; exercises), and feedbacks.</li> </ol>	<ol style="list-style-type: none"> <li>1. The experience confirmed the choice of success factors. Additionally:</li> <li>2. The community needs to have a leader or, possibly, several leaders such as visible contributors.</li> <li>3. The content and meeting discussions should include more practical tasks and exercises. The additional materials need to be revised.</li> <li>4. The community needs some face-to-face sessions.</li> <li>5. The community should have wider contribution from participants with the higher level of professional skills, in addition to the community leader. (The great example was the contribution of another Master’s student who shared her high-level skills in using Power BI’s <i>forecasting feature</i>).</li> </ol>

<p><b>Point 5. Principles:</b></p> <ol style="list-style-type: none"> <li>1. Design for continuation: the Learning Community is expected to improve &amp; continue after the launch.</li> <li>2. The levels: participants of all levels are welcome with the necessary digital skills (i.e. some basic digital skills to build on).</li> <li>4. The terms: participant should have motivation and ability for self-study.</li> <li>5. The driver: participants are driven by their desire for professional growth and/or expanding one's horizons.</li> <li>6. The value: the value for participants comes from a) building Power BI skills, b) preparing for the certification.</li> <li>7. The rhythm: weekly meetings, self-study with assignments to help students stay on track.</li> </ol>	<ol style="list-style-type: none"> <li>1. The experience mostly confirmed the choice of initial principles. Additionally:</li> <li>2. All levels of participants can self-enroll in the community, but some participants with low initial skills should consider taking the beginner's course first.</li> <li>3. Meetings with the leader are not intended to cover everything or teach everything; motivation and dedication for self-study are critical for success.</li> <li>4. Face-to-face meetings can make a beneficial addition to the community's rhythm.</li> </ol>
<p><b>Point 6. Stages of development:</b></p> <ol style="list-style-type: none"> <li>1) <i>Potential</i>: Plan the community, define the domain, identify focus areas, and make a survey with potential participants.</li> <li>2) <i>Active</i>: Launch the community, initiate events and activities, and engage community members.</li> <li>3) <i>Dispersed</i>: The community actively invites new participants and developing new leadership.</li> <li>4) <i>Active (Revisited)</i>: Events and activities with a new leader.</li> </ol>	<ol style="list-style-type: none"> <li>1. The experience confirmed the correct choice of stages.</li> <li>2. The community needs to find a new leader in advance (so that to, ideally, participate early and learn from the previous iteration).</li> </ol>
<p>Element 3. The Learning Community Curriculum</p>	
<p><b>Point 7. Design Curriculum:</b></p> <p>Phase 1. This part was done at the Stating analysis stage.</p> <p>Part 2. The evaluation by the community leader and participants.</p> <p>Phase 3.</p> <ol style="list-style-type: none"> <li>a) <i>Assessment</i>: practical task and pre-exam test.</li> <li>b) <i>Format</i>: live-guided meetings (online and face-to-face), self-study, practical task (a project), forum on Moodle, peers and leader's support.</li> <li>c) <i>Content &amp; Sequencing</i>: MS Learning package, beginner's course on oreilly.com, official MS books, and additional materials (revised and condensed).</li> <li>d) <i>Role of Learning vs. self-learning</i>: live-guided meetings with instructions; the rest is self-learning, and (a teamwork?) on a project.</li> <li>e) Learning diaries as a tool: to possibly drop.</li> <li>f) <i>A real project</i> to create a report and a dashboard from scratch.</li> </ol>	<ol style="list-style-type: none"> <li>1. The experience mostly confirmed the correct choice of contents. Additionally:</li> <li>2. To give participants a real task (a project) for additional practice and problem-solving.</li> <li>3. Additional materials should be revised and condensed.</li> <li>4. Participants suggests dedicating the time away from Learning diaries in favour of a real project - e.g. creating a report from scratch and developing a Power BI Service dashboard, thus allowing participants to practice.</li> </ol>

As seen from Table 23, the revised Implementation plan consists of three main elements. The first element is *the type of the Learning Community*, which has got its own definition, HE Learning Community. The unique name for the community was necessary as the existing notions discussed in Section 2 could not satisfy the needs of the community in the case organization.

The second element of the plan is *Establishing, developing, and leading a Learning community*. The *Success factors* of the learning community include *the Cause*, i.e. the interest to build Power BI skills; the *Objectives*, i.e. building knowledge and/or passing PL-300 certification for those participants who feel ready; the *Sponsorship*, , i.e. the organizational resources including the vouchers for PL-300 certification; *Leadership*, as the vital factor for supporting the development of Power BI skills, as it is the leader “*who will take on responsibilities for facilitating various levels of engagement, collaborative efforts...*” (Donaldson, 2020, Community features); the *Environment and Conditions*, i.e. the ability to create a good atmosphere and provide smooth interaction with all materials and content; the *Content*, which is crucial for the Learning Community; and finally, the *Contribution*, the *Credit* and finally, the *Results*.

The primary insight from the data is that the Learning community needs a leader. After the community completed the meetings, the levels of activity in Moodle and participation dropped. During the summer period of the community, some participants attended actively the live-guided meetings to listen to the guidance. Additionally, a few new participants asked the leader about joining the community and attending the future meetings. It highlighted the necessity for the community to have someone who can 1) promote activities, 2) organize and lead meetings, 3) address members' inquiries, 4) foster growth, and 5) expand knowledge. Furthermore, the Learning community could benefit from wider contribution of participants with a higher level of Power BI skills, who can also guide in the areas of own interest or help in providing a more personalized support. Lastly, face-to-face meetings can complement the current conditions of the Learning Community and help to increase interaction between the participants.

The main *Principles* of the community were revised at the initial stage and mostly remained the same, with some input from validation. First, participants with zero previous knowledge should consider taking a self-study beginner’s course before joining the Learning community. This course could be included as a separate section into the current Moodle course space, and placed before the Microsoft Learning packages. Second, the

live-guided meetings with the community leader do not intend to cover everything; therefore, some discipline and self-management are needed. Third, some face-to-face meetings can bring more rhythm to the community.

As part of *the Stages* in the *Establishing, developing, and leading the Learning community*, it fitted with the initial split into: potential, active, dispersed, and revisited active stages. “The Learning community of Power BI” fitted into these stages, having only five online meetings during the summer (June – July 2023). Afterwards, it strives to establish new leadership for the community and invite new participants.

The third element of the Initial Plan is *the Curriculum design*, which includes very similar elements to those described in the second element of the plan. The curriculum was evaluated twice: 1) by the community leader during the initial proposal, and 2) by participants in the final feedback. Although the format was suggested to remain the same, with only some adjustments, such as additional face-to-face meetings, a big improvement suggestion related to introducing a project (i.e. a practical, real task). Also, the additional materials placed in Moodle should be revised and condensed. The role of self-learning remains the same, emphasizing the community's focus on self-study and motivation. Instead of learning diaries, the participants suggested dedicating this time to a real project - e.g. creating a report from scratch and developing a Power BI Service dashboard, allowing the participants to practice.

The next section will present the executive summary and evaluation of this Thesis.

## 7 Conclusion

This section summarizes the main steps and results of the study. It comes from the objective to outcome, gives some recommendations towards implementation and evaluates the work.

### 7.1 Executive Summary

Nowadays, upskilling and acquiring new skills are vital to remain competitive in the job market. There are various ways to achieve this, and one effective method is through learning communities, where individuals learn together. The objective of the thesis was to plan and implement a learning community for building MS Power BI skills. The business context is the Metropolia University of Applied Science. The challenge of this study was to explore one specific non-curricula form of learning and help student develop their skills beyond the curriculum in order to boost their employability as well as provide more varied learning experience when studying at the university.

The study followed the Applied action research approach. The first step was reviewing existing knowledge, followed by the current state analysis. The data collection consisted of three rounds. Data 1 was gathered through internal interviews and discussions with the staff of the case organization and a survey with students. Data 2 was mainly gathered from discussions with staff after presenting the conceptual framework. Data 3 was collected from final feedback survey from participants after the first round of community implementation, discussions, and interviews with participants, students' learning diaries, and the community leader's log diary.

The theoretical framework focused on exploring the types of learning communities, their main principles, success factors, stages of development, and existing cases of implemented learning communities in universities and companies. However, only the most relevant elements of available knowledge and best practice were selected for the conceptual framework, with many ideas from different authors intertwined and complemented each other, and thus were noted but not always picked up for applying them into practice.

The analysis stage focused on investigating the existing practices of the case organization, its resources and limitations, as well as the needs and expectations of the participants, and the available support from the MS community. The starting analysis showed that the Power BI Learning community makes an attractive, popular idea among the students. Additionally, regarding the case organization, the interviews revealed that at the time of writing this thesis, there were no established learning communities there. Yet, the learning communities were recognized as a desirable direction for development in the action plan of at least one department, Metropolia Business School. The case company was ready to support the community in various ways, also via acquiring vouchers for PL-300 certification, as well as via connecting to the “MS Educator” community, and other type of consultive support.

The analysis and the existing knowledge allowed to build the initial proposal for the Implementation plan for the the “Learning community of Power BI” in the case organization. The proposal consisted of three main elements: 1) selecting type of the learning community, 2) establishing, leading and developing the Learning community 3) build its Curriculum. First, own definition of the community was suggested – the Higher Education (HE) Learning Community. Second, as part of the establishing, leading, and developing a learning community, ten success factors, seven principles, and four stages of development were proposed. Third, the curriculum design consisted of four main phases: 1) data gathering (environment analysis, needs analysis & establishing the learning objectives), 2) evaluation of the curriculum, 3) design and piloting (including the assessments, format, and content and its sequencing), 4) learning vs. self-learning, and the utilization of a learning diary.

The Implementation plan was applied to launching the real-life first iteration of “the Learning community of Power BI” implemented during the summer 2023. In total, it attracted 40 registrations from the students interested in participation. All materials for the Learning community were gathered on the Moodle platform and organized into six main sections. The primary content for the Learning community relied on the official MS Learning packages that providing free, authorized access to the recommended MS Learning paths, modules, and labs. After evaluating these materials, some gaps were identified and additional resources were added. These extra materials included the high-quality courses available on Oreilly.com under Metropolia’s credentials, as well as recordings from the live-guided meetings, books available at the MetCat’s library, additional MS materials not included in the MS Learning packages, high-quality YouTuibe videos, etc.

A total of 20-25 students participated in every live-guided meeting, out of the 5 meetings organized. Fourteen participants, who submitted learning diaries for all six packages and made three attempts at the pre-exam tests, earned the organization-sponsored vouchers and the opportunity to try and obtain the PL-300 certification. After the first round of implementation, the Power BI Learning community continues to exist in the case company as a self-learning community, invites more participants, and looks for a new leader.

## 7.2 Next Steps and Recommendations toward Implementation

The case organization expects the Learning community to have a continuous lifecycle and exists after the initial implementation phase. There are some recommendations towards the final plan can be considered.

First, the HE Learning community can exist as a self-learning community. However, a new leader can bring the community to life and activate participants. This approach is best suited if the community has a few participants with a higher-level skills of Power BI, who can add own contributions to the community. Additionally, it will help the community avoid dependence on just one person.

Second, it would be better to organize some face-to-face meetings and offer participants to do a project. Such meetings will allow for in-person interactions and help break the ice between students, as participants will get to know each other better.

Third, it is necessary to review the content on the Moodle platform and adjust its order and size. The first section could include the beginner's course, allowing every participant with zero Power BI skills to prepare for participation. Then, additional materials should be revised and compressed. Most importantly, a project can provide the participants with a real-life challenge that they can work on from the beginning to the end. While MS packages and labs satisfied participants in the first round, they didn't provide the opportunity for participants to think and practice on a real case.

### 7.3 Thesis Evaluation

This study helped the case organization with establishing its first Learning community that was led not by instructors or lectures but by a Master's degree student with hands-on practical knowledge and the ambition to share and lead student-fellows towards a successful certification of their newly acquired skills.

The objective of the study was to plan and implement a Learning community for building MS Power BI skills among the participants at the case organization. The outcome of the thesis is the revised Implementation plan for establishing, leading and developing "the Learning Community of Power BI". The participants and key stakeholders suggested some corrections and suggestions to the initial plan, based on the implementation results. First, it was suggested to connect to the 'MS Educator' community and provide them with feedback on utilization of the 'MS Learn' free packages for Power BI (as there were some challenges identified, especially in the lab). Second, it was suggested to organize a continuous lifecycle for the Learning community so that another leader can take over later. Third, it was suggested to revise the initial principles from the conceptual framework and align them more closely with what the community can truly offer. Fourth, it was suggested to work further on additional materials from external sources (open access, Metropolia's library, oreilly.com, etc.) and select and condense the best self-learning materials, so that to add to the curriculum.

The participant's survey also revealed some wishes. First, participants wanted for some face-to-face meetings to help increase interaction between participants. Second, participants wanted to allocate more time for discussing the topics and including additional practical exercises. Third, participants also wanted to do a project from start to finish, which would allow to practice creating reports and dashboards, thereby enhancing the participants' problem-solving skills and thinking. Table 23 above demonstrates the revised Implementation plan of this thesis.

### 7.4 Closing Words

Learning communities have become a popular form implemented by many companies and universities. Implementing learning communities for study, self-development, taking exams and getting certifications can be beneficial, encouraging for students, and

engaging as self-development. In any outcome (certification or no certification gain), Learning confinities help to open new horizons, build new skills and networks, and try out and demonstrate the newly acquired competencies, which is a great result in itself.

## References

- Agrifoglio, Rocco 2015. Knowledge Preservation Through Community of Practice. (e-book). Retrieved 18/02/2023.  
<https://metropolia.finna.fi/Record/nelli15.3710000000467344>
- Antinluoma, Markku & Ilomäki, Liisa & Toom, Auli (2021). Practices of professional learning communities. *Frontiers in education*. Vol. 6. P.11-14 27.04.2021. Retrieved 28/02/2023.  
[https://helda.helsinki.fi/bitstream/handle/10138/329803/feduc\\_06\\_617613.pdf?sequence=1](https://helda.helsinki.fi/bitstream/handle/10138/329803/feduc_06_617613.pdf?sequence=1)
- Bartlett, Ruth & Milligan Christine 2015. *What is Diary Method?* (e-book). London: Bloomsbury. Retrieved 22/04/2023.  
<https://www.bloomsburycollections.com/book/what-is-diary-method/ch2-engaging-with-diary-techniques>
- Borzillo, Stefano 2007. *Communities of Practice to Actively Manage Best Practices*. DUV. Retrieved 15/04/2023. <https://link-springer-com.ezproxy.metropolia.fi/book/10.1007/978-3-8350-9609-7>
- Conole, Gráinne 2014. The 7Cs of Learning Design – a new approach to rethinking design practice. Retrieved 13/03/2023.  
<https://www.lancaster.ac.uk/fss/organisations/netlc/past/nlc2014/abstracts/pdf/conole.pdf>
- De Laat, Maarten & Lally Vic & Lipponen, Lasse & Simons, R. - J. (2007). Online teaching in networked learning communities: A multi-method approach to studying the role of the teacher. *Instructional Science*. 35 (3), pp. 257-286.  
[https://www.researchgate.net/publication/226320889\\_Online\\_teaching\\_in\\_networked\\_learning\\_communities\\_A\\_multi-method\\_approach\\_to\\_studying\\_the\\_role\\_of\\_the\\_teacher](https://www.researchgate.net/publication/226320889_Online_teaching_in_networked_learning_communities_A_multi-method_approach_to_studying_the_role_of_the_teacher)
- Donaldson, Jonan Phillip (2020). Building a digitally enhanced community of practice. *Information and Learning Sciences*, Vol. 121 No. 5/6, pp. 241-250.  
<https://doi-org.ezproxy.metropolia.fi/10.1108/ILS-04-2020-0066>
- Dubé, Line & Bourhis, Anne & Jacob, Real (2006). Towards a typology of virtual communities of practice. *Interdisciplinary Journal of Information, Knowledge, and Management*, 1, 69–93.  
<https://www.proquest.com/docview/2616640910?parentSessionId=prlR6hJ9FMT6mYWHNw6Fu1%2FTeKzC6tOGUpeKsv8dH3M%3D&accountid=11363>
- DuFour Richard & Rebecca 2011. *The School Leader's Guide to Professional Learning Communities at Work TM* (e-book). Retrieved 15/02/2023.

<https://ebookcentral.proquest.com/lib/metropolia-ebooks/detail.action?docID=4537538>

DuFour Richard & Rebecca 2016. Concise Answers to Frequently Asked Questions about Professional Learning Communities at Work TM : (Strategies for Building a Positive Learning Environment: Stronger Relationships for Better Leadership), Solution Tree. ProQuest Ebook Central. Retrieved 10/02/2023. <https://ebookcentral.proquest.com/lib/metropolia-ebooks/detail.action?docID=4537538>

Evert Kimberly, & Cooper Stein, Kristy 2022. Teachers' networked learning communities: Does collective participation matter? Teaching and Teacher Education: Leadership and Professional Development. Vol. 1, December 2022. Retrieved 27/02/2023. <https://www.sciencedirect.com/science/article/pii/S2667320722000057>

Hakkarainen, Kai & Paavola, Sami & Lipponen, Lasse (2004). From Communities of Practice to Innovative Knowledge Communities. Line – Lifelong Learning in Europe, 9, 2/2004, 74-83. [https://www.researchgate.net/publication/312115964\\_From\\_communities\\_of\\_practice\\_to\\_innovative\\_knowledge\\_communities#fullTextFileContent](https://www.researchgate.net/publication/312115964_From_communities_of_practice_to_innovative_knowledge_communities#fullTextFileContent))

Hord, Shirley M. & Roussin, Jim & A. Sommers, William A 2009. Guiding Professional Learning Communities: Inspiration, Challenge, Surprise, and Meaning. (e-book). California: Corwin Press. Retrieved 28/03/2023. <https://metropolia.finna.fi/Record/nelli15.3710000000456823?sid=2908463038>

Hughes, Jason & Jewson, Nick & Unwin, Lorna 2007. Communities of practice. Critical perspectives. London: Routledge.

Jun Rong Nigel, Lim & Rosenthal Sonny & Jun Marcius Sim, Ye & Zhao-Yi, Lim & Kai Rong Oh 2021. Making online learning more satisfying: the effects of online-learning self-efficacy, social presence and content structure. Technology, Pedagogy and Education. Vol. 30, Issue 4. P. 543-556. June 2021. Retrieved 15/04/2023. <https://www-tandfonline-com.ezproxy.metropolia.fi/doi/full/10.1080/1475939X.2021.1934102>

Kananen, Jorma 2013. Design Research (Applied Action Research) as Thesis Research. A Practical Guide for Thesis Research. Publications of JAMK University of Applied Sciences 146.

Kivimäki, Ville & Romanoff, Jani & Remes, Heikki 2021. Improvement of teaching and learning experience by online course diary tool: Qualitative exploration of teachers' perspective. 2021. Retrieved 20/04/2023. [https://acris.aalto.fi/ws/portalfiles/portal/75679641/ENG\\_Kivim\\_ki\\_et\\_al\\_Improvement\\_of\\_Teaching\\_and\\_Learning\\_Experience\\_by\\_Online\\_Course\\_Diary\\_Tool\\_Qualitative\\_Exploration\\_of\\_Teachers\\_Perspective\\_EPIC.pdf](https://acris.aalto.fi/ws/portalfiles/portal/75679641/ENG_Kivim_ki_et_al_Improvement_of_Teaching_and_Learning_Experience_by_Online_Course_Diary_Tool_Qualitative_Exploration_of_Teachers_Perspective_EPIC.pdf)

- Lancaster, Andy 2020. Driving performance through learning: Develop employees through effective workplace learning. London: KoganPage.
- Makkonen, Leena 2013. Creating a Community of Practice for E-learning Professionals. Retrieved 26/02/2023.  
<https://www.theseus.fi/bitstream/handle/10024/65139/Final%20thesis%20Leena%20Makkonen%20-%20Creating%20a%20Community%20of%20Practice%20for%20E-learning%20Professionals.pdf?sequence=1&isAllowed=y>
- McDermott, Richard (2000). Knowing in community: 10 critical success factors in building communities of practice. IHRIM Journal, 1–12. Retrieved 15/03/2023. <https://crowdsynergy.wdfiles.com/local--files/community-of-practice/KnowingInCommunity.pdf>
- McDermott, Richard (2000). Community development as a natural step. Knowledge Management Review, 3(5), 16–19
- Mercieca, Bernadette Mary & McDonald, Jacquelin 2021. Sustaining Communities of Practice with Early Career Teachers. Supporting Early Career Teachers in Australian and International Primary and Secondary Schools, and Educational Social Learning Spaces. (e-Book). <https://link-springer-com.ezproxy.metropolia.fi/book/10.1007/978-981-33-6354-0>
- Metropolia (2020). Make a difference with us. Retrieved 10/02/2023.  
<https://www.metropolia.fi/en/about-us>
- Metropolia (2020). Research, Development and Innovation. Retrieved 10/02/2023.  
<https://www.metropolia.fi/en/about-us>
- Metropolia (2020). Study Guidance. Retrieved 1/11/2023.  
<https://www.metropolia.fi/en/academics/general-information-on-studies/manage-your-studies/study-guidance>
- Metropolia (2020). Strategy 2021-2023. Retrieved 1/11/2023.  
<https://www.metropolia.fi/en/about-us/strategy-2030>
- Microsoft Learn (2023). Retrieved 20/04/2023. <https://learn.microsoft.com/en-us/training/>
- Microsoft Teams for Education. (n.d.) Create a PLC team in Microsoft Teams. Retrieved 15/09/2023. <https://support.microsoft.com/en-gb/topic/create-a-plc-team-in-microsoft-teams-ad803fa2-c967-41b4-ae37-0bf60f17fa00>
- MS TEAMS (n.d.). Create a PLC team in Microsoft Teams. Retrieved 28/08/2023.  
<https://support.microsoft.com/en-gb/topic/create-a-plc-team-in-microsoft-teams-ad803fa2-c967-41b4-ae37-0bf60f17fa00>

- Nokia (2023). Learning-and-exam-methods-Jun2020. Retrieved 21.02.2023.  
<https://learningstore.nokia.com/partner/doc/catalog-files/Learning-and-exam-methods-Jun2020.pdf>
- Nokia (2019). Nokia-LMS-Guided-Tour-external. Retrieved 20.02.2023.  
<https://learningstore.nokia.com/partner/doc/Nokia-LMS-Guided-Tour-external.pdf>.
- Paavola, Sami, Lipponen, Lasse & Hakkarainen, Kai 2004, Models of Innovative Knowledge Communities and Three Metaphors of Learning", Review of Educational Research, vol. 74, no. 4, pp. 557-576.  
<https://www.proquest.com/docview/214115137?parentSessionId=jYuoR%2FPcc3gAPK2kaCMYMkztwQXCyRj9KxsTnj2FJs%3D&accountid=11363>
- Premlatha, K R; Geetha, T V 2015. Learning content design and learner adaptation for adaptive e-learning environment: a survey. The Artificial Intelligence Review; Dordrecht. Vol. 44, Issue. 4, P. 443 – 465. December 2015. Retrieved 16/04/2023.  
<https://www.proquest.com/docview/1728123798?parentSessionId=90cMEyp7PqCuDnKPWiwDtwFgsfDb4P6yPu7zV1%2Fjrnk%3D&pq-origsite=primo&accountid=11363>
- Reedy, Alison Kay & Wurm, Penelope A. S. & Janssen, Amanda & Lockley, Alison 2021. A community of practice approach to enhancing academic integrity policy translation: a case study. International Journal for Educational Integrity International journal for educational integrity, 17(1), pp. 1-20.  
[https://www.researchgate.net/publication/352410708\\_A\\_community\\_of\\_practice\\_approach\\_to\\_enhancing\\_academic\\_integrity\\_policy\\_translation\\_a\\_case\\_study](https://www.researchgate.net/publication/352410708_A_community_of_practice_approach_to_enhancing_academic_integrity_policy_translation_a_case_study)
- Schefer-Wenzl, Sigrid & Miladinovic, Igor 2021. Learning Diaries—A Valuable Companion of Mobile Learning for Higher Education in Software Engineering in Internet of Things, Infrastructures and Mobile Applications. 2021. Retrieved 23/04/2023. <https://link-springer-com.ezproxy.metropolia.fi/book/10.1007/978-3-030-49932-7>
- Stabback, Philip 2016. In-Progress Reflection No. 2 on Current and Critical Issues in Curriculum and Learning. What Makes a Quality Curriculum? Retrieved 03/10/2023.  
<https://unesdoc.unesco.org/ark:/48223/pf0000243975/PDF/243975eng.pdf.multi>
- Stoll, Louise & Bolam, Ray, McMahon, Agnes & Wallace, Mike & Sally, M. Thomas 2006. Professional Learning Communities: A Review of the Literature. Journal of Educational Change. Vol. 7(4). P. 221-258. January 2006. Retrieved 09/03/2023.  
[https://www.researchgate.net/publication/226457350\\_Professional\\_Learning\\_Communities\\_A\\_Review\\_of\\_the\\_Literature](https://www.researchgate.net/publication/226457350_Professional_Learning_Communities_A_Review_of_the_Literature)

- Thornton, Katherine (2012). Evaluating a curriculum for self-directed learning: a systematic approach in Independence IATEFL Learner Autonomy Special Interest Group Newsletter, 55. pp. 8 – 11. Retrieved 10/05/2023.  
[https://www.academia.edu/1941451/Evaluating\\_a\\_curriculum\\_for\\_self\\_directed\\_learning](https://www.academia.edu/1941451/Evaluating_a_curriculum_for_self_directed_learning)
- Tractenberg, Rochelle E.& Lindvall, Jessica & Attwood, Teresa K & Via, Allegra 2020. Guidelines for curriculum and course development in higher education and training. Retrieved 03/10/2023.  
[https://www.researchgate.net/publication/340420688\\_Guidelines\\_for\\_curriculum\\_and\\_course\\_development\\_in\\_higher\\_education\\_and\\_training](https://www.researchgate.net/publication/340420688_Guidelines_for_curriculum_and_course_development_in_higher_education_and_training)
- UNESCO. IIEP Learning Portal. (n.d.) Retrieved 15/05/2023.  
<https://learningportal.iiep.unesco.org/en/glossary>
- Vinod, Chandra & Harindran, Anand & Hareendra, Anand. 2017. Research Methodology. Pearson Education India. Retrieved 10/02/2023.  
[https://learning.oreilly.com/library/view/research-methodology/9789353067090/xhtml/chapter001.xhtml#ch1\\_4\\_2](https://learning.oreilly.com/library/view/research-methodology/9789353067090/xhtml/chapter001.xhtml#ch1_4_2)
- Wenger, Etienne & Trayner, B. & De Laat, Maarten 2011. Promoting and Assessing Value Creation in Communities and Networks: A Conceptual Framework. Retrieved 13/03/2023.  
[https://www.researchgate.net/publication/220040553\\_Promoting\\_and\\_Assessing\\_Value\\_Creation\\_in\\_Communities\\_and\\_Networks\\_A\\_Conceptual\\_Framework](https://www.researchgate.net/publication/220040553_Promoting_and_Assessing_Value_Creation_in_Communities_and_Networks_A_Conceptual_Framework)
- Wenger, Etienne 1998. Communities of Practice. Learning, Meaning, and Identity. New York: Cambridge University Press.
- Wenger, Etienne & McDermott, Richard & M. Snyder, William 2002. Cultivating Communities of Practice. Boston: Harvard Business School Press.
- Wenger-Trayner, Etienne (2015) Communities of practice. A brief introduction.  
<https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/11736/A%20brief%20introduction%20to%20CoP.pdf>
- Wenger-Trayner, Etienne & Wenger-Trayner, Beverly 2020. Learning to make a difference : value creation in social learning spaces. New York: Cambridge University Press.
- Wenger-Trayner. 2023. Social learning spaces. The art of learning together. Retrieved 12/03/2023. <https://www.wenger-trayner.com/social-learning-spaces/>
- Wenger-Trayner. 2015. Introduction to communities of practice. Retrieved 19/09/2023.  
<https://www.wenger-trayner.com/introduction-to-communities-of-practice/>

## Appendix 1. Entry survey (40 responses)

### Welcome to the Learning Community of Power BI (summer 2023)!

This community is designed for students in Business Informatics who share the same background, aim to build Power BI skills, and want to try and obtain PL-300 certification.

The Learning Community will consist of weekly meetings, self-learning and helping each other during the learning path.

The Learning community will reside in Moodle, with access to 6 learning packages by MS for self-learning studies that cover theory and some labs for practice. These packages will be complimented with extra materials for deeper learning of each topic. The Learning community will meet on **6 Friday mornings in June-July (9-11 am)** for a lecture input and some demo of Power BI features. The first Introduction meeting will be hold on **2 June, at 9-11 am, online.**

At the Learning community, you will learn how to get and prepare data in Power BI, how to design and develop a data model, how to visualize data and manage workspaces. You will get to know Power Query tricks, difference between merge and append queries, DAX structure and much more.

The community will be led by Anna Vinogradova ([anna.vinogradova@metropolia.fi](mailto:anna.vinogradova@metropolia.fi)), a BI student who has been working as a web analyst at an international advertising agency supporting clients such as Mercedes, Nissan, Philips, etc. with their web tracking implementations plans.

You are warmly welcome to join the Learning Community!

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The organizers look forward to you briefly filling in this brief (takes 3-5 min.).

#### SURVEY QUESTIONS:

1. Do you want to build Power BI skills while studying at Metropolia?
2. Will you be interested to self-train and obtain PL-300 certification (Microsoft Power BI, Data Analyst)?
3. Are you ready to participate in a self-learning community to build Power BI skills in summer 2023 organized by BI Master's programme?
4. What is your motivation to participate?
5. How many hours could you invest into self-learning in summer 2023 (per week)?
6. What are your current Power BI skills? Please choose one of these:  
Zero/Beginner/Basic/Intermediate/Advanced
7. Any suggestions/expectations/wishes/comments from you?
8. If you want to register for the Learning community in summer-2023, please give your e-mail here for sending you invitation.

**Appendix 2. Learning diary, questions**

## GENERAL QUESTIONS:

1. age: \_\_\_\_\_
2. my Degree programme & the year of studies: \_\_\_\_\_
3. my motivation to participate: \_\_\_\_\_
4. my current level of Power BI skills: \_\_\_\_\_
5. my previous experience in data analytics: \_\_\_\_\_
6. my target & expectations: (e.g. to get acquainted with Power BI as a tool, to increase my current level of skills, to pass the certification, etc, my expectations...):  
\_\_\_\_\_
7. date when you started: xx.xx.2023 - date when you finished: xx.xx.2023

## SESSIONS 1-6, FOLLOW-UP after each session:

1. what kind of materials have I used out of this package? \_\_\_\_\_
  2. how much time have I spent on absorbing these learning materials (realistically): xx h
  3. what kind of tasks / assignments have I done? \_\_\_\_\_
  4. what was the easiest part for me? \_\_\_\_\_
  5. what was the most challenging part/task for me? \_\_\_\_\_
  6. what have I learnt from this self-learning package? \_\_\_\_\_
  7. what content I found most useful in this package? \_\_\_\_\_
  8. what do I need to train more? \_\_\_\_\_
  9. what questions do I have? \_\_\_\_\_
- Open-end comments & observations: \_\_\_\_\_

### Appendix 3. Learning community continues as a Self-learning community

Dear BI students,  
we want to draw your attention to one excellent **self-learning community** that we have currently available in the BI Programme. This is the collection of materials from this year's "**Learning community of Power BI**" 2023, online.

These materials are **freely available online, in Moodle**, and may be useful to you in two ways:

1) you may get acquainted with Power BI, and doing analytics and visualizations there (for expanding own horizons; no grade). It will be available also further for these purposes, so you can come back to it later on.

2) for training purposefully towards PL-300 certification "Data Analyst" (you will get graded, 5 ECTS, if pass). NOTE, this is a good option for either very persistent students, who are ready to self-study towards a certification, or those with previous experience in Power BI as they need less training. Here, **we can offer you a Voucher for the Exam valid till 31st December 2023.**

In case you are interested, welcome to read more below.

KR

Anna, Learning community leader-2023 & Zinaida (BI team)

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Learning community of Power BI was designed for students who are interested (and have some initial knowledge and skills) in Business Analytics. The learning community aims to improve "MS Power BI" skills, and try and obtain PL-300 certification ( <https://learn.microsoft.com/en-us/certifications/exams/PL-300/> ).

The Learning Community was conducted in summer-2023 and consisted of 5 weekly meetings, self-learning and helping each other during the learning path in summer 2023.

All Learning community materials are still **available in**

**Moodle:** <https://moodle2.metropolia.fi/course/view.php?id=7909&section=9>

**Password for self-enrollment** to this course space: Power BI

**Learning community materials include:** access to 6 learning packages by MS for self-learning studies that cover theory and some labs for practice. These packages are complimented with extra materials for deeper learning of each topic. The material also include video recordings of 5 meetings/demos with the lecturer's input (Anna Vinogradova) and demonstrations of Power BI features.

**At the Learning community, students learn:** how to get and prepare data in Power BI, how to design and develop a data model, how to visualize data and manage

workspaces. They also get to know Power Query tricks, difference between merge and append queries, DAX structure and much more.

**How students got the Voucher for free access to PL-300 “Data Analyst” Exam:**

The students who pass the Pre-assessment with 80% of scores get a Voucher Code (you can try as many times as needed, and most of our students have got these scores). In case you tried persistently, but got somewhat lower scores, we will also consider your result.

The community was successfully led by Anna Vinogradova, a Master’s student in Business Informatics who has been working as a web analyst at various international companies and had first hand experience with Power BI. Currently, Anna is unavailable for comments due to being busy with her thesis writing. **We are looking for a new Community leader, welcome to apply!**


**You are warmly welcome to use the materials of the Learning Community!**





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In case you are interested to join, the organizers look forward to your SELF-ENROLLMENT in the Moodle course & start using it!




BI team, Anna & Zinaida





**Appendix 4. Curriculum design (Initial proposal vs. Implementation)**

Curriculum, topics	How planned (Initial proposal)	How realized (Implementation)
<p>Overview of the content</p>	<p>The content will be structured around the key topics necessary for achieving the PL-300 certification, and will consists of six learning paths as outlined by Microsoft with extra materials, such as available courses for students than could be provided by university, videos, books etc.</p> <ol style="list-style-type: none"> <li>1) The Power BI basics – what is Power BI, the main three elements of the tool, basic building block of the Power BI.</li> <li>2) Getting data, cleaning and transforming data.</li> <li>3) Designing, developing a data model. Creating measures using DAX and Model optimization.</li> <li>4) Visualizing data that includes different types of visuals, create reports, dashboards.</li> <li>5) Data analysis.</li> <li>6) Managing workspaces and datasets in Power BI.</li> <li>7) Extra materials.</li> </ol>	 <p>The screenshot shows a page titled "The main page" with a list of learning paths:</p> <ul style="list-style-type: none"> <li>Discussions and questions</li> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> <li>6. Manage workspaces and da...</li> <li>SUBMIT YOUR LEARNING DIA...</li> <li>Extra Materials</li> </ul>





<p>Section 1</p>	<p><b>First learning package “Get started with Microsoft data analytics”</b> has two modules: “Discover data analysis” and “Get started building Power BI blocks”:</p> <p>1) <i>Discover data analysis</i> includes the next topics:</p> <ul style="list-style-type: none"> <li>- Main categories of analytics (descriptive, diagnostic etc.)</li> <li>- Different roles in Data (Business analyst, Data analyst etc.)</li> <li>- Tasks of data analyst (prepare, model etc.)</li> </ul> <p>2) <i>Get started building with Power BI</i> includes:</p> <ul style="list-style-type: none"> <li>- Parts of Power BI</li> <li>- Building blocks of Power BI (dashboards, reports, visualizations, tiles etc.)</li> <li>- Power BI service</li> </ul>	<p><b>The main page</b></p> <p>Discussions and questions</p> <hr/> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> <li>6. Manage workspaces and da...</li> </ol> <p><b>LEARNING PATH № 1: GET STARTED WITH MS DATA ANALYTICS</b></p> <ul style="list-style-type: none"> <li> Module 1. Discover data analysis.</li> <li> Module 2. Get started building with Power BI.</li> </ul> <p><b>ADDITIONAL MATERIALS:</b></p> <ul style="list-style-type: none"> <li> Interface Tour of Power BI</li> <li> Power BI for beginners</li> </ul> <p>From this video you will get a quick overview how to install Power BI</p>
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<p>Section 2</p>	<p><b>Second package calls “Prepare data for analysis”.</b> This learning path includes 2 modules: “Get data in Power BI” and “Clean and transform”:</p> <p>1) <i>Get data in Power BI</i> that covers the next topics:</p> <ul style="list-style-type: none"> <li>- Getting data from files, relational data sources, NoSQL database, online services, Azure Analysis Services.</li> <li>- Selecting a storage mode.</li> <li>- Fixing performance issues and resolving data import errors.</li> </ul> <p>2) <i>Clean and transform</i> module includes:</p> <ul style="list-style-type: none"> <li>- Shaping the data (promoting headers, renaming columns, removing rows and columns, unpivoting and pivoting columns).</li> <li>- Simplifying the data structure (renaming queries, replacing values, removing duplicates).</li> <li>- Evaluating and changing column data types.</li> <li>- The difference between Append vs Merge queries.</li> <li>- Examining data structure and finding anomalies in data.</li> <li>- M language.</li> </ul>	<div style="border: 1px solid #ccc; padding: 10px;"> <p><b>The main page</b></p> <p>Discussions and questions</p> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li style="border: 1px solid #ccc; padding: 2px;">2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> </ol> <p><b>LEARNING PATH № 2 : PREPARE DATA FOR ANALYSIS</b></p> <ul style="list-style-type: none"> <li> Module 1. Get data in Power BI                     <ul style="list-style-type: none"> <li>Lab - Prepare data in Power BI Desktop</li> </ul> </li> <li> Module 2. Clean, transform, and load data in Power BI.                     <ul style="list-style-type: none"> <li>Lab - Load data in Power BI Desktop</li> </ul> </li> </ul> </div>
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<p>Section 3</p>	<p><b>The third learning package “Model data in Power BI”</b> consist of 3 modules:</p> <p>1) <i>Design a data model</i> covers:</p> <ul style="list-style-type: none"> <li>- Work with tables (building relationships, configuration table and column properties)</li> <li>- Creating a date table via Source data, DAX, Power Query.</li> <li>- Work with dimensions (hierarchies, role-playing dimensions)</li> <li>- Defining data granularity and creating relationships between tables</li> <li>- Types of table’s relationships.</li> </ul> <p>2) <i>Introduction to creating measures using DAX in Power BI</i>. This module covers:</p> <ul style="list-style-type: none"> <li>- Calculated columns vs measures</li> <li>- How context affects DAX</li> <li>- Calculate function.</li> <li>- How to use relationships effectively</li> <li>- Semi-additive measures</li> <li>- Time intelligence</li> </ul> <p>3) <i>Optimize a model for performance in Power BI</i> module covers:</p> <ul style="list-style-type: none"> <li>- Performance optimization.</li> <li>- Review and analyze performance of measures, relationships, and visuals.</li> <li>- Use variables to improve performance, readability, troubleshooting.</li> <li>- Reducing cardinality.</li> <li>- Optimize Direct Query models with table level storage.</li> <li>- Create and manage aggregations.</li> </ul>	<p><b>The main page</b></p> <p>Discussions and questions</p> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li style="border: 1px solid orange;">3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> <li>6. Manage workspaces and da...</li> </ol> <p><b>LEARNING PATH № 3: MODEL DATA IN POWER BI</b></p> <ul style="list-style-type: none"> <li> Module 1. Design a data model in Power BI             <ul style="list-style-type: none"> <li>Lab - Design a Data Model in Power BI</li> </ul> </li> <li> Module 2. Introduction to creating measures using DAX in Power BI             <ul style="list-style-type: none"> <li>Lab - Create DAX Calculations in Power BI Desktop</li> <li>Lab - Create Advanced DAX Calculations in Power BI Desktop</li> </ul> </li> <li> Module 3. Optimize a model for performance in Power BI</li> </ul>
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<p>Section 4</p>	<p><b>The fourth learning package is “Visualize data in Power BI”.</b> It consists of 4 modules, working with Power BI visuals, creating a data-driven story, dashboards, and reports:</p> <p>1) <i>Work with Power BI visuals</i> module discusses next topics:</p> <ul style="list-style-type: none"> <li>- Add visualizations to reports and choose an effective visualization, i.e. types of visualizations.</li> <li>- Formatting the visualizations and importing a custom visualization.</li> <li>- Add an R or Python visuals.</li> <li>- Work with KPIs.</li> </ul> <p>2) <i>Create a data-driven story with Power BI reports</i> module consists of:</p> <ul style="list-style-type: none"> <li>- Report design and navigation.</li> <li>- Bookmarks, buttons, selection.</li> <li>- Interactions, hierarchies.</li> <li>- Advances interactions and drill through.</li> <li>- Conditional formatting.</li> <li>- Slicers, filters, sorting data.</li> <li>- Publish reports and comment to the reports.</li> <li>- Tune report performance.</li> <li>- Optimize reports for mobile apps.</li> </ul> <p>3) <i>Create dashboards in Power BI</i> modules discusses:</p> <ul style="list-style-type: none"> <li>- Dashboards vs Reports</li> <li>- Data alerts</li> <li>- Q&amp;A feature</li> <li>- Dashboards themes</li> <li>- Pin a live report page to a dashboard</li> </ul>	<p><b>The main page</b></p> <p>Discussions and questions</p> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li style="border: 1px solid orange;">4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> <li>6. Manage workspaces and da...</li> </ol> <p><b>LEARNING PATH № 4: VISUALIZE DATA IN POWER BI</b></p> <ul style="list-style-type: none"> <li> Module 1. Work with Power BI visuals             <ul style="list-style-type: none"> <li>Lab - Design a report in Power BI desktop. <b>NB!</b> In this lab you need to sign in Power BI Service.</li> </ul> </li> <li> Module 2. Create a data-driven story with Power BI reports             <ul style="list-style-type: none"> <li>Lab - Enhance a Report in Power BI Desktop. <b>NB!</b> In this lab you need to sign in Power BI Service</li> </ul> </li> <li> Module 3. Create dashboards in Power BI             <ul style="list-style-type: none"> <li>Lab - Create a Power BI dashboard. <b>NB!</b> In this lab you need to sign in Power BI Service.</li> </ul> </li> <li> Module 4. Create paginated reports</li> </ul>
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	<ul style="list-style-type: none"> <li>- Real-time dashboard</li> <li>- Data classification</li> <li>- Set mobile view</li> </ul> <p>4) <i>Create paginated reports</i> has next main topics:</p> <ul style="list-style-type: none"> <li>- Paginated reports.</li> <li>- Get data.</li> <li>- Create a paginated report.</li> <li>- Work with charts on the report.</li> <li>- Publish the report.</li> </ul>	
<p>Section 5</p>	<p><b>The fifth learning package is “Data analysis in Power BI”, it consists of 2 modules:</b></p> <p>1) <i>Perform analytics in Power BI</i> module includes next themes:</p> <ul style="list-style-type: none"> <li>- Statistical functions.</li> <li>- Identifying outliers.</li> <li>- Grouping data for analysis.</li> <li>- Clustering techniques.</li> <li>- Time series analysis.</li> <li>- AI insights.</li> </ul> <p>2) <i>Work with AI visuals in Power BI</i> module has these topics:</p> <ul style="list-style-type: none"> <li>- Q&amp;A visual.</li> <li>- Key influencers visual.</li> <li>- Decomposition Tree visual.</li> </ul>	<p><b>The main page</b></p> <p>Discussions and questions</p> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> </ol>

		<p><b>LEARNING PATH № 5: DATA ANALYSIS IN POWER BI</b></p> <ul style="list-style-type: none"> <li> Module 1. Perform analytics in Power BI</li> <li> Module 2. Work with AI visuals in Power BI</li> </ul> <p>Lab - Perform Data Analysis in Power BI</p> <p><b>ADDITIONAL MATERIALS TO MODULE 1:</b></p> <ul style="list-style-type: none"> <li> Use basic statistical functions</li> <li> Identify outliers</li> </ul>
<p>Section 6</p>	<p><b>The sixth package is “Manage workspaces and datasets in Power BI”</b> consists of 3 modules:</p> <p><i>1) Create and manage workspaces in Power BI</i></p> <ul style="list-style-type: none"> <li>- A report or dashboard.</li> <li>- Usage and performance.</li> <li>- Troubleshooting data.</li> <li>- Configure data protection.</li> </ul> <p><i>2) Manage datasets in Power BI</i></p> <ul style="list-style-type: none"> <li>- What-if parameters.</li> <li>- Gateway.</li> <li>- Scheduled refresh.</li> <li>- Incremental refresh.</li> <li>- Manage and promote datasets.</li> <li>- Troubleshoot service connectivity.</li> <li>- Query caching.</li> </ul>	<p><b>The main page</b></p> <p>Discussions and questions</p> <ol style="list-style-type: none"> <li>1. Get started with MS data an...</li> <li>2. Prepare data for analysis</li> <li>3. Model data in Power BI</li> <li>4. Visualize data in Power BI</li> <li>5. Data analysis in Power BI</li> <li style="border: 1px solid orange; padding: 2px;">6. Manage workspaces and da...</li> </ol> <p>SUBMIT YOUR LEARNING DIA...</p>

	<p><i>3) Implement row-level security</i></p> <ul style="list-style-type: none"><li>- Row-level security.</li><li>- Row-level security with the dynamic method.</li></ul>	<p><b>LEARNING PATH № 6 : MANAGE WORKSPACES AND DATASETS</b></p> <ul style="list-style-type: none"><li> Module 1. Create and manage workspaces in Power BI</li><li> Module 2. Manage datasets in Power BI</li><li> Module 3. Implement row-level security</li></ul> <p><b>VIDEOS for this class session:</b></p> <ul style="list-style-type: none"><li> Video LEARNING PATH № 5-6</li><li> Video by Anna, Meeting 7 of July 2023</li><li> Power Point Slides (Meeting 07.07.2023)</li><li> Power Point Slides (Meeting 30.06.2023)</li></ul>
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