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AN ANALYSIS OF THE INTRODUCTION AND DEVELOPMENT OF SYSTEMS OF PORTFOLIO ASSESSMENT IN HIGHER EDUCATION PROGRAMS

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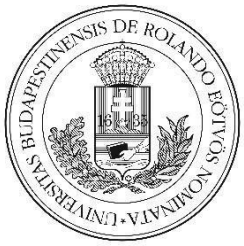

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CONFIRMATION OF THESIS CONSULTATION

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Student's name: .....Brian Norberg .....

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Time of consultation	**Topic of the consultation, notes, suggestions**	**Supervisor's signature**
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I allow the submission of the thesis.

Budapest, 2023.5.2.....

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DECLARATION OF ORIGINALITY

I, the undersigned Brian Norberg, a student in the ELTE PPK Educational Science Program in awareness of my criminal liability declare and confirm with my signature that the thesis titled "An Analysis of the Introduction and Development of Systems of Portfolio Assessment in Higher Education Programs" is **my own independent intellectual work** and the use of the referenced, printed and electronic, literature occurred according to the general rules of copyright laws.

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Abstract

Systems of portfolio assessment in higher education are becoming increasingly adopted each year, however, the initial process of their successful implementation and continuing development at different institutions and programs are a topic that has not been thoroughly investigated. Portfolio assessment is defined as assessment based on the systematic collection of learner work (such as written assignments, drafts, artwork, and presentations) that represents competencies, exemplary work, or the learner's developmental progress. This research aims to explore the different patterns of introducing and implementing portfolio assessment at different levels and supporting academics and administrative staff during this process. The research method used is case study analysis involving the Initial Teacher Education (ITE) program at Eötvös Loránd University (ELTE), the CHARM-EU University Alliance, and Dublin City University (DCU). In the research design, a document analysis and a series of semi-structured qualitative interviews with different staff levels from administrators to directors to teachers were conducted using each of these three programs. The main benefits of introducing portfolio assessment were found to be supporting authentic learning, greater transversal skill development, encouraging student reflection, and documenting student progress and skills for future development. Necessary teacher training and support requires preparation for the assessor role, practice evaluating portfolios using examples, guidance in using the portfolio model and platform, and suggestions of how to involve portfolios in courses. Future plans are diagnosing current flaws, strategic planning for these problems in response to feedback, and continuing expansion of portfolio assessment with new modules and purposes.

Keywords: Higher Education Assessment, Formative Assessment, Learning Portfolio, Professional Portfolio, Portfolio Evaluation, Professional Learning of Evaluators, Case Studies

Introduction

The usage of portfolios in higher education has been a growing topic of interest for over two decades and has become widely adapted to a number of institutions and programs during that time. This research aims to investigate and analyze how a system of portfolios for assessment is first introduced, developed, and evaluated at varied programs and institutions. Case study interviews were conducted with different staff levels from administrators to directors to teachers. The goal of this case study is that it will be of use to future programs and institutions considering implementing similar programs of portfolios for assessment. It is hoped that insight gained from this research could then also be used to create a practical guide to the implementation of portfolios for assessment in higher education.

The research questions for this study were as follows: (1) What are the main features and steps of introducing, implementing and evaluating portfolio assessment in HE programs and what are the hoped-for benefits? (2) What teacher preparation and support is required for the successful implementation of portfolio assessment systems in higher education programs? (3) What are the expected future trends and directions for existing portfolio assessment programs?

Case study based research for this paper has been primarily through interviews along with document analysis. A brief literature review of previous work has been conducted on the topic of how portfolio assessment is implemented in higher education programs. For the interviews, participants were selected purposively based on the

following criteria: (a) they are administrators of a program or institution using portfolios for assessment (b) they are teachers of such a program or institution that have used portfolios for assessment as part of the programme (c) they are directors of assessment, evaluation, or instruction of portfolio assessment systems. The three cases which were reached out to are: an initial teacher education programme at Eötvös Loránd University (ELTE), CHARM-EU, and Dublin City University (DCU) in Ireland. Participants were invited to participate in the study through their official e-mail and were also informed that their identities would be protected from the public.

Portfolio Assessment in Higher Education: A Literature Review

Main Focus of the Review

The main focus of this literature review is to address the existing studies and articles that have previously covered the topics that this research aims to cover. The topics of this focus are defining what is meant by a portfolio in the context of education, existing theories behind portfolio assessment as they pertain to the cases chosen for this study, the perceived benefits of using portfolio assessment system, the challenges involved with these systems, and how teachers are prepared for the implementation of such a system. These topics of focus for the literature review have been chosen for their relevance to the research questions explored by this study. Through review of these sources, a comparison between them and the data gathered from this research became possible. It was expected that many similar themes or ideas would come up in the research results, but also that new data would become available that had not been previously addressed in the existing literature.

For the topics of defining portfolios in educational context and the theories behind their assessment, sources were used across different levels of education and not limited to the level of higher education. The intent behind this decision was to consult with a wide variety of sources in order to address the scope of different interpretations of portfolio assessment. For the remaining topics, greater focus was placed on primarily using sources on portfolio assessment within the higher education context so that the information gathered from these sources could be more accurately compared to the results of this study.

Literature Search

The literature that was utilized for analysis was collected using different academic search engines and educational database systems, namely the Andor system of Tampere University, Google Scholar, ERIC, EBSCO, ResearchGate, and Taylor & Francis. As portfolio assessment has been a popular topic of discussion in academia since the late 1980s, there are naturally many varied and international results when one searches databases using keywords and phrases such as “portfolio assessment in higher education” that offer different perspectives on the topic. These perspectives ranged from student opinions on the digital literacy required by digital portfolios (also known as electronic portfolios, e-portfolios, online portfolios, and other names) to their effectiveness in assessing incoming undergraduate students to the specific utility of portfolio assessment with remote and blended learning as observed during the height of the pandemic. Other key terms that were searched for were “teacher preparation portfolio assessment,” “portfolio assessment effectiveness,” “portfolio assessment tool,” “portfolio framework higher education,” “portfolio assessment strategy,” “portfolio assessment benefits,” “portfolio assessment challenges,” “portfolio assessment outcomes,” “portfolio assessment development,” “portfolio assessment implementation,” “portfolio assessment evaluation,” “portfolio assessment future,”

"portfolio assessment Hungary," "portfolio assessment Ireland," and "portfolio assessment trends."

With such a historic wealth of global literature available, it was necessary to sift through the published books and articles for literature that could be somewhat comprehensively representative of different periods over the span of decades in which portfolios in higher education assessment have been a topic of popular research while maintaining an emphasis on research and articles published within the previous 15 years. Efforts were also made to try to primarily limit the sources chosen to those that examined portfolio assessment in the cultural contexts this study has targeted, particularly the context of Hungary.

Literature Analysis

Defining Portfolios

To start with, it is important to define what portfolios and digital portfolios are. A precise and authoritative definition of portfolios, digital or otherwise, is elusive because what constitutes a portfolio differs according to the specific context in which they are used. A definition for portfolios that might approach authoritative status in that it is the result of two years of deliberation by a consortium of educators and because the article in which it was first published in 1992 has, according to Google Scholar, since been cited 906 times, is that of Arter and Spandel. This definition is as follows:

> A purposeful collection of student work that tells the story of the student's efforts, progress, or achievement in (a) given area(s). This collection must include student participation in selection of portfolio content; the guidelines for selection; the criteria for judging merit; and evidence of student self-reflection. (Arter & Spandel, 1992)

This early definition is notable for being rather prescriptive and strict in its requirements for what a portfolio is, particularly in that it qualifies portfolios as needing to have protocol for choosing student artifacts and how to evaluate these artifacts. This definition furthermore clearly emphasizes that portfolios include examples of student work, but the role of the student in these portfolios seems of almost secondary importance in the way that only student "participation" is required in selecting content (presumably according to the required guidelines) while ostensibly any evidence that student reflection has taken place is sufficient to qualify a collection of artifacts as a portfolio. This does not reflect more modern conceptions that portfolios should be student-centered in order to provide students with greater engagement, motivation, and responsibilities in their own educational experiences via a strong emphasis on reflection (Brown, 2001; Klenowski et al., 2006; Lewis, 2015; Marinho et al., 2021; Syzdykova et al., 2021; Tochel et al., 2009; Zubizarreta et al., 2009). In this way, the idea that portfolios are indeed collections of artifacts remains correct even if the focus may be somewhat outdated.

Certainly, a more recent definition that accurately reflects the greater emphasis of portfolios on reflection and the involvement of students in their own learning would be more illustrative of modern conceptions. To this end, a popular definition often cited due to its perceived comprehensiveness is that of Cooper and Love (2007), who first define a portfolio in the context of education as:

> An organized collection of documents or artifacts that can be used to demonstrate knowledge, skills, values and achievements, which contains a commentary or exegesis to explain the relevance, credibility and coherence of each artifact or document, and where necessary provides information about standards of performance. (p. 267)

Next, e-portfolios (referred to in this study as digital portfolios) are simply described by the same authors as, “a generic term that includes any form of online portfolio, Web-based portfolio or any portfolio stored or communicated using electronic technologies” (p. 267). Given these definitions, this study will still include digital portfolios under the broader umbrella of portfolios as the differences in nature between the two are not viewed as so vast to merit repeated differentiation in reference terminology. While these definitions are clearly quite broad, and this is even admitted by the usage of the word “generic” in their description, they have agreement on the essence of portfolios being that they are collections of artifacts but seemingly place more importance on the reflective or explanatory aspect involved in the selection of materials. They also expand the purpose of the materials selected to not only demonstrate achievements but instead reflect a greater understanding that portfolios should demonstrate beliefs and competences. This makes these definitions more fitting for the types of portfolios generally observed within the case studies selected by this research.

Several other definitions by myriad authors can be found and could be provided here, but they are similarly and necessarily broad while sharing the same understanding of portfolios as collections of artifacts accompanied by reflection (Baume, 2001; Chye, 2021; Davis & Ponnamperuma, 2005; Murray 1997; Paulson et al., 1991; Popescu-Mitroia et al., 2015; Qvortrup & Keiding, 2015; Walland & Shaw, 2022). One of the ways that definitions do have some differentiation is based on the context of the discipline in which they’re used. For instance, a portfolio for a professional architect will differ from a portfolio used by a veterinarian which will differ from a portfolio used by an academic which will differ from one submitted by their students for assessment purposes. Within each of the above examples, the types of documents or artifacts that are included will further vary. Aside from discipline, the major way that portfolios are differentiated is the goals behind their implementation and assessment, a topic that is covered in detail in the following section on types of portfolios. Overall, this variation represents the challenge of portfolios, but also their strength in that the concept, in theory, is vague or “generic”, while in actuality is multifarious and uniquely representative of whomever creates each portfolio. As can be surmised, this makes the practice of uniformly assessing a portfolio for what it represents to be as potentially intractable as the usage of portfolios is potentially beneficial. This study is meant to represent an attempt at attenuating this essential tension.

Types of Portfolios

Narrowing what portfolios represent to the specific context of higher education to this task could possibly be helpful despite the fact that it unfortunately presents its own difficulties as to how they should be classified and how to reconcile overlap between designated categories. One such division used is to create subcategories such as student portfolios, teacher portfolios, and institutional portfolios before then additionally dividing them by function such as whether they are used to find a job, to document skills and abilities, to monitor and evaluate performance, etc. (Lorenzo & Ittelson, 2005). Problematically for this division, many portfolios can be created to serve one or more of these functions and different subcategories can serve the same functions. For example, both a learner in an education course and their professor might each have a portfolio that is assessed and evaluated for seeking a job while also being based on their performance as part of a program. Some authors find this differentiation of portfolios by these specific purposes to be useful and add others of their own, such as alumni development and career planning, even while they acknowledge that there is

often significant overlap among different functions (Reese & Levy, 2009). Others choose not to divide portfolios by the aforementioned subcategories or functions but instead classify them into different types based upon their goals, e.g. representational portfolios for selectively displaying achievements, developmental portfolios for recording progress or assignments over time, and reflective portfolios for including personal reflections on the artifacts and documents included in the portfolio (Villano, 2006). Once again, a lack of a single authoritative source or agreement among scholars makes defining even different kinds of portfolios to narrower contexts a problematic pursuit.

Another common, broad division of portfolios in higher education programs is by whether their purpose is for **formative or summative assessment**, even though there is once again overlap between these two categories (Klenowski et al., 2006; Ripley, 2013). Those that are designated specifically for formative assessment are commonly differentiated as Learning Portfolios (LPs). The characteristics of LPs are defined as being processes, not specifically end products, that are flexible combinations of reflection and documentation and based upon evidence. They are further characterized by their deliberate focus on selected outcomes meant to both improve and assess learning in an ongoing, reflective, and analytical manner (Zubizarreta et al., 2009). An example of what kind of things might be included in the process of creating an LP is discussed by Bolliger & Shepherd (2010) in their study of an American public research university's implementation of LPs in various graduate programs. Learners in this example were asked to create artifacts such as resumes, summaries of personal goals and achievements, descriptions of individual learning philosophies, evidence of successful attainment of learning outcomes, and other artifacts that they considered meaningful towards demonstrating their learning journey.

Portfolios for summative assessment, on the other hand, are often called the "traditional model" or the "assessment portfolio" and are differentiated by more usually being simple collections of documents or artifacts by learners combined with self-assessment and written justification for the materials included in the portfolio. These assessment portfolios have, as a key feature, predefined requirements and rubrics or other criteria for their evaluation. They are noted to frequently be for the purpose of appraisal or promotion and as having high stakes similar to an examination without focus on the process of learning, how the learner is progressing, the purpose of their learning, and the context in which it occurs. It is noted that LPs created for formative assessment may eventually serve similar functions of summative assessment whereas those initially created solely for summative assessment focus more on showcasing achievements without reflection on the process towards those achievements (Klenowski et al., 2006). In this way, both categories of portfolios are used for assessment purposes though their guiding philosophy may differ.

The fact that a "portfolio" can refer to a wide variety of different assessment and learning tools and the praxis behind them is well-known and such vexing diversity can even be observed within a single country (Dysthe & Engelsen, 2011). Meeus et al. specifically address the breadth of the field of portfolio usage in higher education and what a confused field it is due to different nomenclature and classification of portfolios by different authors and institutions. At the time of their publication, they found in recent literature no fewer than 49 different names for portfolios, names such as Smart Portfolios, Documentation Portfolios, Course Portfolios, Development Portfolios, etc. They further found 28 different classifications of portfolios based on ambiguous criteria, examples of these classifications being Feedback Portfolios, Objective Portfolios, Evaluative Portfolios, Training Portfolios, etc. The authors attempt to cut

the Gordian knot of portfolios in higher education by delineating four **modes of implementation** they see as resulting in the largest determinant factor in how portfolios are conceptually interpreted, these four modes being portfolios for (1) admission into higher education, for (2) assessment of student competencies in higher education, for usage in (3) job applications, and for usage in (4) continuing professional development as part of one's career (Meeus et al., 2006).

Due to the problematically nebulous nature of portfolio classification by different terms, this study will make no attempt to further muddy the waters either by subscribing to a single source's definitions that are likely at least slightly contradicted by other sources or by attempting to add new classifications or nomenclature to the field. Portfolios can, and indeed usually do, serve multiple functions with their purpose rarely remaining static or easily relegated to a single type. For this reason and for the purposes of this study, portfolios as collections of artifacts selected by participants with a reflective component involved will be the broad definition used when observing portfolio systems at each of the chosen case studies. Digital portfolios will be viewed as essentially similar, only differentiated by involving some kind of technological component or not existing solely in physical form. It is acknowledged that these working definitions may result in criticism akin to comparing apples and oranges when looking at the different cases, though the literature would first have to have significantly more unanimous agreement on what apples and oranges are in order for this to require being more thoroughly addressed. In this study, these non-mutually exclusive types will be used for describing the portfolios observed in each of the cases in depth.

Theories of Portfolio Assessment

The process of portfolio assessment is closely linked to the purpose(s) of the portfolio being assessed and so is also very susceptible to high degrees of variation and unfortunate frustration on behalf of the stakeholders involved in the process when expectations surrounding it are not made entirely clear. A short but influential document that has been cited 1749 times since its publication in 1991 put forth the idea that portfolio assessment and instruction are inextricably linked to the point of simply using portfolios purely for either assessment or instruction is impossible if one is to fully implement a portfolio system. The idea is furthered when portfolios as an assessment tool are distinguished for putting students as participants in the assessment process via their reflection on and selection of materials to be included according to given instructions over the entirety of the learning period utilizing portfolios (Paulson et al., 1991). Portfolio assessment, then, as it is defined this way is meant to provide a broader, complex, more authentic vision of student performance in context of the learning environment and their progress towards learning goals that are most often selected or agreed upon by both students and instructors. Assessment for portfolios is also notably unique in this sense in that the student is a direct participant in the process via their selection of what they consider the most demonstrative materials for the purposes of the portfolio as well as their reflective component also expressing judgment or assessment of their materials.

Another early proposal for portfolio assessment is that of the Cognitive Model for Assessing Portfolios (CMAP). CMAP insists that since what is being assessed is more complex thought processes and growth over time, no simple one-dimensional model of whatever facts or skills have been acquired can be applied to portfolio assessment. It proposes instead a highly multidimensional model across the three broad dimensions: activity, history/progression, and involved stakeholders of which each

dimension has respective subdivisions. The activity dimension is divided into the categories of rationale (purpose of the portfolio), intents (the goals of the portfolio, roughly), contents (artifacts in the portfolio), standards (evaluative criteria), and judgments (overall appraisal of the portfolio). The historical dimension is divided into antecedents (initial conditions at the start), transactions (what developments happen during the time the portfolio is utilized), and outcomes (current conditions). The stakeholder dimension is divided into the interested parties that the portfolio concerns and can vary, though the typical categories are the student, the teacher, representatives of the administration, aggregators, and assessors (Paulson & Paulson, 1990). These dimensions are displayed in the following reprinted table:

Figure 1: The Different Dimensions of CMAP

Note: Reprinted from "How Do Portfolios Measure Up? A Cognitive Model for Assessing Portfolios. Revised." by Paulson, L.F. & Paulson P.R., 1990, *Annual Meeting of the Northwest Evaluation Association,* p. 6

CMAP also advises that judgments, rather than the one-dimensional scores in which people generally focus solely on end numbers to the point of entirely forgetting what is actually being tested, be used in order to match the subjective nature inherent in portfolio construction. In cases where quantitative data as an end result is demanded, psychometric analysis is a recommended solution (Paulson & Paulson, 1990). Psychometric analysis techniques, "use multiple judges (sometimes representing different points of view) to make independent ratings…the sums of judgments by all judges…develop an overall index" (Paulson & Paulson, 1990, p.15). What is being described here by Paulson & Paulson is essentially the use of 360-degree assessment for increasing the validity of portfolio assessment. Parveen (2020) defines 360-degree assessment, noted to also often be called multi-source assessment or multi-source feedback, as, "a process through which feedback from peers, teachers, supervisors, parents as well as a self-evaluation by the students themselves is gathered" (p. 4). This procedure allows the quantification of subjective assessments from multiple sources to allow portfolio assessment to measure outcomes that are only judged with great difficulty using standardized, traditional assessment methods (Paulson & Paulson, 1990).

This tension between a need for subjective assessment in order to achieve the intended benefits of portfolio complexity and the demand for objective or quantitative scoring in order to fit traditional educational models is one that continues to be one of the main challenges of portfolio assessment even to this day, as will be later seen in some of the case study data.

CMAP was later used as a basic for what became called two separate practical paradigms of its implementation, the paradigms being deemed **positivism** and **constructivism**. Simply stated, the positivist paradigm of portfolio assessment places greater emphasis on the included artifacts demonstrating progression or attainment of externally determined standards for the sake of greater standardization or uniformity in order to create what is ideally a highly reliable system of assessment. By contrast, the constructivist paradigm emphasizes included artifacts reflecting a student's view of the process of their own learning in a way that is too complex and variable to allow a focus on the reliability of the assessment system via a highly standardized approach (Paulson & Paulson, 1994). Despite these two paradigms ostensibly springing from the same source, the balancing act between the reliability and validity of a standardized approach without curtailing the breadth of possible benefits portfolios represents to the learning process remains an ongoing problem (Baume, 2001; Tochel et al., 2009).

The positivist approach to portfolio assessment is commonly used in programs where the purpose of the assessment tool is awarding official certification or otherwise collecting large amounts of student data for easier administrative oversight. Rhodes (2010) notes that this approach to portfolio assessment has taken strong precedence in many programs since digital portfolios have largely replaced physical ones, thereby making the collection of large amounts of data much more convenient and the process of using psychometric analysis on that data much more efficiently done with software. This purpose of portfolio assessment is further favored when such systems are initiated in programs for the purpose of greater oversight from administration, greater alignment with perceived skill demands from the current labor market, greater compliance with government initiatives in the educational sector, or some combination of these purposes (Kelly-Riley et al., 2016). This appeal to stakeholders via the potential insight into the educational process of students or of a program overall, combined with what seems to be a balance between innovation in assessment methods and traditional demands for hard, quantifiable data that can be provided from psychometric analysis, makes the allure of the positivist approach quite clear. Given the increasing role of technology in modern life and the growing demands for accountability in educational programs, the choice to implement a positive approach over a constructivist approach in many programs is understandable.

The constructivist approach to portfolio assessment does not have mutually exclusive reasons for implementation compared to a positivist approach though it does have a difference in overall focus. A constructivist approach to portfolio assessment, for example, tends to create more innovative learning environments wherein students are encouraged to use prior knowledge, critical thinking, and advanced problem solving skills to tackle challenges that are often complex and more realistic in nature than can be assessed with more traditional approaches (Allen, 2004). Tigelaar et al. (2005) further point out that less reliance on externally determined factors for assessment allows for dynamism of both teaching and learning, thus allowing for a course to continually, organically evolve as new research and understanding brings updates to the field(s) involved. With advantages of being able to adapt not only to students' current understanding but also to adapt with students in an ongoing dialogue with the complex problems and skill development needed for these problems, the constructivist approach to portfolio assessment is favored by programs with heavy emphasis on innovation over accountability.

A further useful theoretical distinction between different portfolio assessment systems is to distinguish between at what **level the decision** was made to implement such a system. Dysthe and Engelsen (2011) utilize a useful system that is divided into three levels, namely the micro-level, the meso-level, and the macro-level. Portfolio assessment systems implemented at the micro-level typically represent teachers who have chosen to apply such a system to their own courses in the belief that it will assist students in their learning. The meso-level represents the decision of implementation being made at the university or departmental level. Finally, the macro-level of implementation is when educational authorities recommend or require a portfolio assessment system (Dysthe & Engelsen, 2011).

The theories or paradigms of positivist and constructivist portfolio assessment along with their levels of implementation will form the strongest framework for the chosen cases of this study. Each general theoretical approach to portfolio assessment presents its own challenges and benefits and has a strong impact on the way that each portfolio system is received while still not entirely determining a system's impact.

Portfolio Assessment Benefits

There are many documented benefits to portfolio assessment. This section will explore the literature on the topic of these benefits by examining each benefit in depth and observing how it is attested to across various articles on the topic. Following a section explaining the limitations in existing literature, the first category of benefits that will be addressed are the benefits to individual students, the second is the benefits to groups of students, the third is the benefits to teachers, and the final category is the benefits to administrators. These categories are not mutually exclusive, but rather used to create a general ordering system. The benefits of portfolio assessment that are examined in detail are, in order, its encouragement of learner reflection, its stimulation of the development of transversal skills and ability to assess them, its advantages for formative assessment, its advantages as a collaborative tool that allows for peer assessment, its opportunities for 360-degree evaluation, its openness to complex and authentic learning experiences in context, its ability to assess professional competences, and its allowance of great administrative oversight of a program.

If the obstacles that the widespread variability of portfolios and their assessment practices is clear, the question of why portfolios are used at all, i.e. their potential benefits over traditional methods of assessment, should be addressed. As is often lamented in the currently established literature, many of these benefits are regrettably theoretical in nature based on potential opportunities offered by systems of portfolio assessment when they are implemented effectively. Furthermore, the issue of successful implementation of portfolio assessment systems often so contextually specific to the place where they are studied that there are few, if any, results that can be seen as universally applicable (Bolliger & Shepherd, 2010; Chye, 2021; Scully et al., 2018; Tochel et al., 2009). The problem of positive results, aside from being heavily contextualized, is compounded by the fact that much existing literature of successful implementation is based upon attitudes and perceptions rather than empirical, quantitative data about success with, say, improving student attainment of learning objectives. This results in much of the existing research seeming effusively and, perhaps ironically, thoughtlessly or uncritically positive on the results of portfolio implementation (Qvortrup & Keiding, 2015). Bryant and Chittum (2013), who did a review of existing literature on the subject, conclude that adoption of portfolio systems outruns the amount of studies that have been done on their empirical effectiveness due, perhaps, to the wider nature of educational science tending to "leap before it looks" out of consistent hunger for innovation. Given these issues, a discussion of the benefits of portfolios as an assessment tool will still have to remain principally theoretical in nature.

Of course, much of the research on the benefits of portfolio assessments tends to focus on the benefits to individual students. One of the most mentioned benefits is that of the greater emphasis placed on student reflection and the commensurate benefits involved (Allen, 2004; Brown, 2001; Cooper & Love, 2007; Davis & Ponnamperuma, 2005; Marinho et al., 2021; Reese & Levy, 2009; Peet et al., 2011; Qvortrup & Keiding, 2015; Skrabal et al., 2012; Walland & Shaw, 2022; Zubizarreta et al., 2009). The benefits frequently collocated with this reflection include supporting lifelong learning habits, deeper learning, writing skills, greater self-awareness and awareness of the perspective of others as students reflect what initial understanding they began with, what they have learned, and how well they have learned it, and what their strengths and weaknesses may be in a certain area.

Another often mentioned benefit to individual students from systems of portfolio assessment is the **development of transversal skills** that apply across many

specific disciplines or situations. This benefit also applies to teachers since these systems allow teachers to assess these competences in students, a requirement that may exist at the end of a learning program in order to achieve certification in a certain field such as teacher education. These benefits arise from the non-traditional approach to assessment offered by portfolios and include skills such as critical thinking, problem solving, creativity, interpersonal communication, writing ability, research skills, scientific literacy, and, in the case of digital portfolios, technological skills (Bolliger & Shepherd, 2010; Klenowski et al., 2006; Marinho et al., 2021; Syzdykova et al., 2021; Walland & Shaw, 2022). These benefits further help students with their future careers by making them more attractive to employers as well-rounded candidates (Scully et al., 2018).

In terms of benefits both to students and teachers, the ability of a portfolio system as a tool for formative assessment that allows constant feedback on student work is also mentioned often in the literature. It allows teachers, via this formative assessment, to more easily understand the progress of their students and what knowledge and skills they may still be lacking while also providing frequent opportunities for more personalized advising (Bolliger & Shepherd, 2010; Donaldson, 2021; Ngui et al., 2022; Torre, 2019). Portfolios can thus also function as an effective starting point for discussions between the students and their teacher or mentor on the prior knowledge of individual students, their competences, and their ongoing progress in a program. These opportunities for feedback are particularly helpful when they are seen as a part of the learning process and not as requiring of special attention or effort from students (Davis & Ponnamperuma, 2005; Klenowski et al., 2006; Reese & Levy, 2009). This is also viewed as motivating students to take a greater role in the learning process in general (Donaldson, 2018; Jones, 2010; Klenowski et al., 2006; Syzdykova et al., 2021).

Portfolios are also useful as a collaborative tool to encourage both greater teamwork and individual achievement either when peer assessment is a component of a portfolio system or students are otherwise assessed based on group tasks (Child & Shaw, 2019). Complex group tasks as part of a portfolio also foster teamwork skills via the social interactions necessary to accomplish the task (Lewis, 2015). For peer assessment, research has found that implementing a practice of peer review of portfolio entries resulted in students undertaking more revisions of their submissions and eventually submitting work of higher quality (Bolliger & Shepherd, 2010). Aside from their benefits for encouraging individual reflection, such group tasks as part of a portfolio can also strongly encourage collaborative, group reflection on the achievement of these tasks and create a feeling of community (Bolliger & Shepherd, 2010; Qvortrup & Keiding, 2015; Valeri-Gold et al., 1992). Finally, group tasks that will be assessed as part of a portfolio spur students to share their understanding with each other through active discussion of the task as well as to offer guidance and reassurance to each other for the sake of group success (Bhattacharya & Hartnett, 2007; Ngui et al., 2022; Wang & Jeffrey, 2017).

As portfolio systems are quite broad, they are also able to support a diversity of learning approaches, various methods of assessment within themselves, and even potentially involve multiple assessors in a 360-degree assessment approach for greater reliability and student development (Davis & Ponnamperuma, 2005). Separate from simple peer assessment, 360-degree assessment involves assessment from not only peers but also from teachers, supervisors, mentors, and also the students themselves. Properly implemented, 360-degree assessment allows greater insight into the personality and strengths of students both individually and as a group, identifying

learning curves of a course or program, potential reasons for students withdrawing from a course or program, problems with engagement between instructors and students, and other possible learning barriers (Parveen, 2020).

Portfolios are further mentioned as a beneficial tool for teachers to overcome the drawbacks of other assessment systems due to the nature of portfolios allowing for a constructivist approach to assessment and the supporting of authentic learning activities in either formative or summative assessment contexts via the supporting of complex assessment such as problem-based learning (Cooper & Love, 2007; Donaldson 2021; Syzdykova et al., 2021). Authentic learning activities are learning activities that reflect intricate, realistic scenarios with opportunities for multiple solutions that utilize multiple skills from across varied disciplines and often require collaboration (Hesterman, 2016). These authentic learning opportunities allow teachers to better prepare their students for their future careers while students benefit from this real-world practice ahead of entering the workforce. Learners themselves also often express a preference for portfolio assessment and its varied assessment methods, when implemented correctly, over traditional modes of assessment when they are given the choice (Tochel et al., 2009; Wang & Jeffrey, 2017).

When portfolios are assessed based on the attainment of professional learning outcomes, then the involved portfolios have advantages for the documentation of professional skills, graduate attributes, acquisition of professional skills, and summative achievements at the end of a higher education program while giving students greater access to administration and assessment processes along the way (Cooper & Love, 2007; Davis & Ponnamperuma, 2005; Murray, 1997). This enhanced transparency also benefits teachers by reducing the potential for confusion or disagreement from students regarding assessment procedures. When these professional skills are documented, they can also assist the student when they are later applying either for employment or for advanced studies or programs and then even further throughout their careers as aids for promotion or tenure considerations (Bolliger & Shepherd, 2010; Murray, 1997; Reese & Levy, 2009; Scully et al., 2018; Syzdykova et al., 2021).

For administrators, aforementioned benefits of greater oversight and ability to set learning directives while gathering data on the efficacy of different courses or programs is mentioned again here (Cooper & Love, 2007). Granted, this is certainly a benefit more applicable to systems of digital portfolio assessment due to the convenience for handling vast sums of data. This data allows greater oversight into the overall effectiveness of a program, into an instructor's performance across multiple courses, and into potential biases or inconsistencies in assessing students of different backgrounds, races, or gender identities (Kelly-Riley et al., 2016). With this data available, administrators can alter programs and courses or otherwise offer additional training to instructors so that a program can strive to be as fair as possible for all students. Having conveniently recorded records on each student also makes the role of support staff easier since they can more appropriately advise students based on their demonstrated strengths from portfolio work (Reese & Levy, 2009).

Portfolio Assessment Challenges

Just as there are many potential benefits to the implementation of a portfolio assessment system, there are also many challenges. While some of these challenges are universal to all levels of implementation, they can still be loosely grouped into categories based on what level of portfolio assessment implementation they most often occur in, whether that level is the micro-level, the meso-level, or the macro-level. The

challenges that will be explored in depth in this section are ordered according to their most common occurrence in ascending order from micro-level to macro-level. In order, the challenges addressed in this section are incorrect understanding of portfolio assessment systems, the perceived burden of achieving sufficient understanding of these systems, the establishment of clear expectations and understanding of the purpose of implementing these systems, privacy concerns regarding stakeholders involved in these systems, technical skill requirements in the cases of digital portfolios, and the greater resource requirements of portfolio assessment systems in terms of the required time, effort, and other resources demanded by their implementation.

One of the major challenges involved in portfolio assessment that most frequently occurs at the micro-level is a misunderstanding or lack of complete understanding of what portfolios are, how to assess them, and how to effectively implement them within the context of a course or program. This **incorrect understanding** can manifest in several common ways. One of these ways is the tendency of educators and programs to simply rebrand traditional assignments such as essays as being portfolios when they have more than one simple element, for example an essay combined with a short reflective component, and then to still assess them traditionally while being surprised when nobody notices the new clothes these assessments have been dressed in (Cooper & Love, 2007). Another common challenge with understanding is the problem of simply treating portfolios as repositories of documents without any reflection or exegesis, then later assessing these repositories summatively as a mere collection of smaller assessments (Arter & Spandel, 1992; Cooper & Love, 2007; Lewis, 2015; Ripley, 2013). When either students or assessors believe that portfolios are simply wholesale collections of previous student artifacts or assessments, then these assemblages are not truly portfolios because they lack the reflective component and context of each artifact that is meant to be one of the core facets of portfolios.

Naturally, a remedy for incorrect understanding at the micro-level is instruction or professional learning. However, this training can prove a prohibitive step for implementation both for students and instructors who may already feel overburdened with their existing responsibilities and therefore either hesitant or unwilling to learn a new assessment system (Akleh & Wahab, 2020; Torre, 2019). Feelings of participants in a portfolio assessment are often even contradictory, where they acknowledge its potential usefulness and yet still feel that the effort costs involved in becoming familiarized with it are greater than possible benefits (Reese & Levy, 2009; Skrabal et al., 2012; Syzdykova et al., 2021; Tochel et al., 2009). For students, when they are **feeling burdened** by the task of learning a portfolio system, tend to adopt a noncommittal approach to associated tasks instead of actually engaging with the system as intended (Bolliger & Shepherd, 2010; Walland & Shaw, 2022). For instructors, research has shown the potential negative consequences of an **instructor's unfamiliarity or lack of belief** in a portfolio system to have a frustrating and discouraging effect on students' engagement with the system (Scully et al., 2018; Tochel et al., 2009).

Expectations and the reasons for implementation of systems of portfolio assessment at the micro-level also need to be made **explicitly clear** to all stakeholders before beginning and also throughout the process, especially to students so that they understand the value of it and do not view it as busy work (Bolliger & Shepherd, 2010; Klenowski et al., 2006). This is, unfortunately, another tension or contradiction in portfolio assessment since portfolios are generally meant to be student-centered and open and yet they must be assessed by criteria set forth by the teacher that represent

implicit, though perhaps minor, restrictions on the content submitted (Qvortrup & Keiding, 2015). Students and teachers may strike a balanced agreement on the types of artifacts to be included for assessment, though this can be more difficult when the portfolio is ultimately assessed summatively for certification or adherence to externally established requirements. Such guidelines for assessment also potentially hinders teachers from fully considering or engaging with a student's portfolio if they are judging it simply by its adherence to whatever guidelines they have created or been given in order to make the assessment process quicker or more convenient (Tigelaar et al., 2005). However, when expectations are not clearly laid out in a somewhat restrictive way, then **students are often left feeling helpless or frustrated** due to not knowing what they are "supposed" to include in order to achieve high results on assessment (Wang & Jeffrey, 2017). Still, for ideas of fairness of the assessment and maintaining student motivation, it is essential that students be given insight into how the assessment process is conducted and how those assessing their work arrive at their final judgments, whether that is via providing students with a clear rubric or other information (Donaldson, 2021; Tigelaar et al., 2005).

Another challenge with portfolio systems and their assessment that most often occurs at the meso-level is issues of **privacy** for those who submit materials to the portfolios (Akleh & Wahab, 2020). Tochel et al. (2009), for example, found multiple studies where student participants felt afraid that any honest reflection that they provided might somehow be used against them and therefore felt greater pressure to hide their shortcomings in their portfolios, particularly when they knew their portfolios would be assessed. Given that portfolios are, by design, meant to be personal creations by their participants, issues with precisely how private or confidential they are give rise to ethical questions when the portfolios are at least partially assessed based on personal reflection (Bolliger & Shepherd 2010; Davis & Ponnamperuma, 2005). This ethical issue also arises in the case of sharing portfolio contents with other stakeholders or using it as an example for instructing teachers or students in future years what an effective portfolio looks like. In these cases, no personal information from the student should be used and their explicit permission to use their portfolio should be granted, if possible (Arter & Spandel, 1992). These challenges of privacy can be somewhat mitigated by being explicitly clear to students that whatever their portfolios may be read by others, though this may have a negative impact on the kind of artifacts included in the portfolio and thus reduce its value as an educational tool (Klenowski, et al., 2006; Tochel et al., 2009).

In the cases where digital portfolios are considered distinct from physical or paper portfolios, research has found that insistence on purely digital portfolios, usually occurring at the meso-level since technical systems are often chosen by an entire program or institution, often creates greater focus on the **technical issues** involved with initial implementation and ongoing development than on portfolios as a learning tool (Love & Cooper, 2004; Tochel et al., 2009). Another challenge with digital portfolios is that they demand greater technical skills for teachers that may currently lag behind their students in this area and therefore teachers are prone to feel even further burdened by the additional technical training needed on top of other training required for familiarization of the chosen portfolio system itself (Akleh & Wahab, 2020). Digital skill inequity between students from different backgrounds presents a further problem, particularly when it involves students of lower socioeconomic backgrounds (Cooper & Love, 2007; Kelly-Riley et al., 2016; Ngui et al., 2022; Walland & Shaw, 2022).

The last and most common challenge that can occur at any level but is very commonly reported at the macro-level (due to macro-level usually being mandatory or otherwise inflexible implementation) by students, teachers, and administrators is the **sheer time, effort, and resources** required by the implementation and continuation of a portfolio assessment system when compared to traditional assessment methods (Scully et al., 2018; Syzdykova et al., 2021). The extra time commitment required from teachers to not only properly assess each student portfolio but also often to become familiarized with it as a new system in the first place is well-documented, and the literature discussing the challenges of portfolio assessment is replete with mentions of time costs involved for teachers (Akleh & Wahab, 2020; Arter & Spandel, 1992; Ciesielkiewicz et al., 2019; Cooper and Love, 2007; Davis & Ponnamperuma, 2005; Davis & Ponnamperuma, 2010; Peet et al., 2011; Ripley, 2013; Skrabal et al., 2012; Tigelaar et al., 2005; Tochel et al., 2009; Walland & Shaw, 2022). The time cost for students comes up less frequently, but it is still a challenge worth consideration (Arter & Spandel, 1992; Bolliger & Shepherd 2010; Donaldson, 2022; Ripley, 2013). As for the institutional level, administrators still need to dedicate ample time and resources to the development of a portfolio system in order for teachers to be trained in it and for it to be appropriate for the specific learning goals and context of the institution (Scully et al., 2018).

How to Prepare Teachers for the Implementation of a Portfolio Assessment System

Teacher preparation and support in the implementation and continuation of a portfolio assessment system is critical to the system's success to the point where a lack of clear understanding by and a lack of support for teachers using the system will mean that the goals of the system will not reach expected results (Scully et al., 2018). It is therefore essential to examine the ways in which teachers can and should be prepared for such a system, and to know what actions are most effective in this regard.

Torre (2019) is particularly useful in identifying the critical factors involved in successful portfolio assessment system implementation and recommends some training of teachers to overcome these obstacles. Among these factors are ensuring that teachers are sufficiently experienced with the portfolio tool, that they are trained in digital skills, that they have a positive and willing attitude towards portfolios, that they incorporate portfolios into their routine teaching, that actual importance is given to portfolios for summative and formative evaluation, and that teacher and student expectations align. To ensure these factors are adequately handled, Torre recommends training teachers on the use of portfolios both in theory and with practical examples of solid cases, sample exercises, and effective feedback. She also suggests training be focused on ensuring that teachers share a perception of the usefulness of portfolios, that they implement appropriate strategies to construct portfolios, that they assist students in the development process, and that they understand the need to provide constant feedback to combat motivation attrition from students. Her article notes that such training has proven to be effective in expanding teachers' skills in using portfolio systems when they are given exemplars found in literature and that their willingness to introduce their use in their teaching then increases (Torre, 2019).

Murray (1997) wrote a helpful text on many different facets of teaching portfolios which is generally relevant to portfolio assessment but also particularly to the ELTE ITE case study context. He stresses that, in portfolio assessment for formative purposes, validity and reliability should not be primary concerns but instead the achievement of designated learning outcomes should be paramount (p. 47). In the context of this study, reliability is defined as, "the degree to which test scores are free

from errors of measurement…Measurement errors reduce the reliability of the score obtained for a person from a single measurement" (Moss, 1994). Issues with reliability, in accordance with this definition, can be mitigated by methods such as the aforementioned procedure of 360-degree validation, but in this book it is emphasized that reliability concerns should not be the main consideration of one assessor when tasked with evaluating portfolios. Murray acknowledges the difficulty of assessing portfolios lies in their complexity due to containing both quantitative and qualitative data, but he emphasizes that this is a virtue of portfolios for providing a more complete picture of the portfolio creator and that any challenges involved with the assessment of qualitative material are exaggerated when assessors are typically required to evaluate qualitative data all the time when they observe research papers, publications, and teaching (Murray, 1997, p. 48). Though he does not use the term, he goes on to say that potential disputes or difficulties with evaluating portfolios can be mitigated by constructive alignment, i.e. requiring specific content in the portfolio that will be evaluated using explicit criteria that have a clear relationship to the desired learning mission (p. 49-50).

Another highly relevant area to this study is how portfolio evaluators should be chosen and trained. As is demonstrated by the cases examined in this research, many separate staff members can fulfill the role of evaluators, and those staff members may be the teacher that facilitated the creation of the portfolio, other faculty members of the same department as the module or program where the portfolio system is implemented, supervisors of the student, or other potential staff. In this way, a teacher can exclusively be the facilitator of the portfolio, or the teacher may fulfill both roles as facilitator and assessor. Murray (1997) dismisses the notion of a "highly trained group of raters" as lacking the ability to holistically assess portfolios but instead tending to turn portfolio evaluation into a mechanical task (p. 53). He also addresses the fact that most higher education faculty have scant experience in pedagogy or assessment techniques but instead develop their individual teaching styles based on imitation of other teachers and through trial and error. This is believed this to be insufficient for providing insight into other teaching styles and thus it is recommended to train teaching and learning portfolio assessors in a variety of teaching styles and approaches for assessing a wide variety of potential artifacts. Murray (1997) recommends that, if portfolios are to be considered trustworthy assessment tools, then all evaluators should undergo uniform training in assessing portfolios with reliability, validity, fairness, and social consequences, even if, as mentioned above, the reliability and validity of portfolio assessment is not the most important concern. Baume (2001) generally shares agreement with these criteria for effective portfolio assessment but also adds the categories of value and efficiency to make sure that whatever is produced is of sufficient worth to merit the time spent creating it and assessing it. Still, the purpose of the portfolios must be considered when deciding on assessors, e.g. encouraging greater improvement of content-specific knowledge should have evaluators from that department whereas encouraging exchange in teaching between different disciplines should have an interdisciplinary team assess portfolios as a group (Murray, 1997).

Research Aims, Questions, and Methodology

Research Aims

This research aims to investigate and analyze how a system of portfolios for assessment is first introduced, developed, and evaluated at varied programs across different higher education contexts. It is intended to reveal crucial factors and actions for successful implementation of these systems and what steps, obstacles, or milestones

in their continuing development can be expected. Ideally, this study can then serve an instructive purpose for future higher education programs looking to introduce similar systems.

As demonstrated in the literature review, there has been continuing and quickly growing interest in portfolios, digital and otherwise, in higher education programs across the world as innovative learning and assessment tools (Scully et al., 2018). Systems of portfolio assessment have been implemented at different levels ranging from national initiatives to individual teachers utilizing such a system in modules that they teach (Dysthe & Engelsen, 2009). They have also served different goals such as eventual certification in a profession, encouraging greater engagement in the learning process, providing greater analytic insight into a program, or some combination of the above purposes. The context, goals, and manner in which systems of portfolio assessment are implemented tend to have strong impact on the achievements of and reception to such a system.

Given the growing interest in portfolio assessment in higher education programs and the strong influence that the initial implementation of such a program has on its effectiveness, the aims of this study are to observe three separate cases that each represent different purposes for implementation, different levels of implementation, and different continuing development strategies since their introduction. The key areas of observation involve the initial context in which each portfolio assessment system was created, the goals of each system both at their beginnings and over time, the preparation and support that was provided to teachers as the main assessors in and implementers of these systems, the current perceptions the involved stakeholders have of them, and the plans or predictions for the future development of each. To investigate this, three main research questions were proposed and are listed below.

Research Questions

1. What are the main features and steps of introducing, implementing and evaluating portfolio assessment in HE programs and what are the hoped-for benefits?
2. What challenges exist and what preparation and support for teachers is required for the successful implementation of portfolio assessment systems in higher education programs?
3. What are the expected future trends and directions for existing portfolio assessment programs and what recommendations do current practitioners have for other programs?

Research Methodology

Research Methods

This study applied a qualitative case study research design to explore in a holistic way how programs of portfolio assessment are introduced and developed at the modular, institutional, and program levels in higher education. This research utilized a case study method incorporating a data triangulation procedure of documents and semi-structured interviews to answer the proposed research questions.

It is first useful to define case study as a research method. Yin (2017) offers an elaborate, two-fold definition refined over decades. He provides such a definition in order to distinguish case study research in its features and scope from other research methods that may be seen as having some overlap, such as experimental research or survey research. The clarification about case study research focusing on contemporary phenomena is to separate it from historical research while the distinction of having a real-world context is to separate it from experimental research that investigates a

phenomenon that is removed from context. Case study research is also distinguished from survey research due to case study research's emphasis on context (which may not be easily differentiated from the observed phenomenon) whereas survey research is quite limited in its engagement with context. In short, case studies observe and explore a current phenomenon as it fully exists in context without removing it from that context or changing any of its elements. Yin's two-fold definition is as follows:

> A case study is an empirical method that
>
> - investigates a contemporary phenomenon (the "case") in depth and within its real-world context, especially when
> - the boundaries between phenomenon and context may not be clearly evident
>
> A case study
>
> - copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result
> - benefits from the prior development of theoretical propositions to guide design, data collection, and analysis, and as another result
> - relies on multiple sources of evidence, with data needing to converge. (Yin, 2017, p. 30)

A triangulation procedure was used to gather findings from each case study. Thurmond (2001) defines triangulation as, "the combination of two or more data sources, investigators, methodologic approaches, theoretical perspectives, or analytical methods within the same study." For the current study, data triangulation was used, simply meaning the combination of multiple different sources of data. The sources of data for each case were documents on the portfolio assessment system employed in each case, semi-structured interviews conducted with administrators involved in each case, and semi-structured interviews conducted with academic staff experienced with the portfolio assessment systems of each case.

Analysis of relevant documents regarding portfolio assessment in each case study was performed. Bowen (2009) offers the following definition for documents: "documents contain text (words) and images that have been recorded without a researcher's intervention" (p. 27). As for document analysis, he defines it as, "a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material… document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge" (Bowen, 2009, p. 27). These definitions fit the procedure that was performed using the documents gathered from publicly available sources such as websites as well as documents that were provided by interviewees for analysis. The focus of data collection from these documents was their relevance to answering the proposed research questions.

Semi-structured interviews were the other data collection method used as part of the data triangulation procedure. For research purposes, interviews are defined as, "an interchange of views between two persons conversing about a theme or a topic of mutual interest…conversation between two or more people (the interviewers and the interviewees) where questions are asked to obtain information from the interviewees" (Ruslin et al., 2022, p. 22-23). Semi-structured interviews are distinct from structured interviews in that the interview does not follow a rigidly defined procedure of question order and phrasing and they are different from unstructured interviews by virtue of the preparation involved in planning a loose interview guide. Ruslin et al. (2022) further explain the common characteristics of semi-structured interviews as being exploratory in nature, using a guide concentrated on a central subject, and seeking general patterns

in responses. This semi-structured interviews of this study follow this model as they were based around the main topic of portfolio assessment and followed planned interview guides while maintaining flexibility to suit the responses of the interviewees.

Two interview guides were prepared for these interviews, one for academic professionals (university teachers and directors) and the other for administrators. Both of these guides can be found in Appendix 1 of this study. Each shared the same six general parts or subsections based around the proposed research questions regarding the main topic of portfolio assessment. The six subsections were (1) basic information about the interviewee, (2) the key structural features of the portfolio assessment system in their program, (3) their experience with the practice of portfolio assessment, (4) the process of implementation and development of the portfolio assessment system in their program, (5) the teacher training and support in regard to portfolio assessment in their program, and (6) the current challenges and future directions of their program's portfolio assessment system. The research model can be found in the table below.

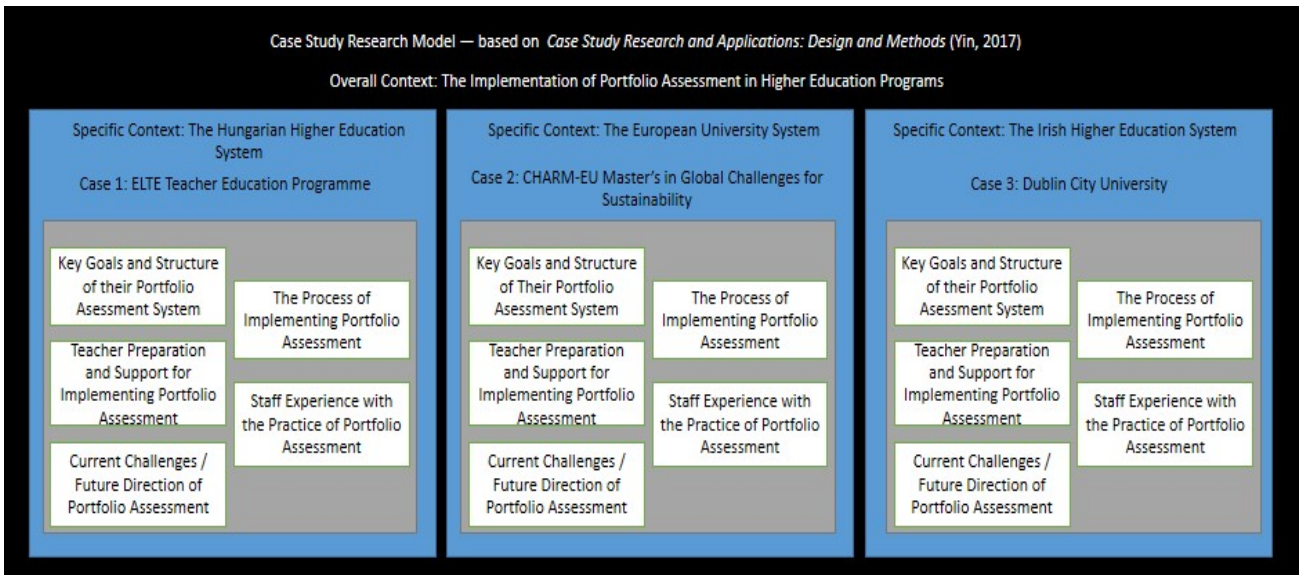


Figure 1. The description of the three cases and the c*ase study design*

Sampling Strategy

This study utilizes a purposive sampling strategy based around a combination of matched comparison sampling for greater diversity among cases, expert sampling for interviewees from these cases with the richest potential information, and snowball sampling after getting into contact with experts at each institution that contacted colleagues with similar interests and potential relevance to the study. Purposive sampling is defined as being, "based on the judgement of the researcher as to who will provide the best information to succeed for the objectives study" (Etikan & Bala, 2017). The same authors explain expert sampling strategy as when:

> The researcher here seeks for the consent of those that are expert or known expert in the area of study, and begin the process of collecting his information directly from individual or group of respondent. It also involves sample assembling of group of people that can demonstrate using their experience or those that specialized in part of the areas. (Etikan & Bala, 2017, p. 2)

Matched comparison sampling is defined as, "studying and comparing cases that differ significantly on some dimension of interest" (Patton, 2017, p. 405). Finally, snowball

sampling is defined as, "[building] the sample as you interview by asking each interviewee for suggestions about people who have a similar or different perspective" (Patton, 2017, p. 451).

The matched comparison strategy of sampling was used specifically to find programs as cases that represented different program types, different locations, different levels of implementation of portfolio assessment systems, systems that have been in operation for varied amounts of years, systems of diverse scope, and as well as systems of different purposes, whether those purposes would be broadly categorized as being positivist or constructivist in nature. The following table clearly displays the major differences among these cases that were the cause for their selection for this study.

Name of Program Case	Program Type	Location of Program	Level of Implementation of Portfolio Assessment	Age of Program
ELTE Teacher Education Program	Teacher Education program (undivided system)	Budapest, Hungary	Macro-level (established by government decree) and Meso-level (differs according to each institution)	~18 years (2006 Bologna-type teacher education implementation)
CHARM-EU Master's in Global Challenges for Sustainability	Master's Degree program	Across Europe: Spain, Ireland, the Netherlands, France, Hungary	Meso-level (programmatic assessment across modules)	~3 years (Since September 2021)
Dublin City University	University-wide implementation	Dublin, Republic of Ireland	Meso-level (available to the entire institution) and Micro-level (usage is optional for each teacher)	~8 years (Pilot program began in September 2016)

Scope of System	Brief Purpose for Portfolio Assessment System
National and Institutional	Assessment of teacher competences, continuing professional development, understanding of learning process
Institutional	Holistic, Student-centered Learning via complex assessment methods such as PBL and CBL
Institutional	For Initial Teacher Education: Mandatory. Other Programs and Modules: Variable

Figure 2: Brief overview of chosen cases for study

The expert sampling strategy was used to find interviewees in each case that were likely to be knowledgeable about the system of portfolio assessment in their programs. This usually involved into looking into the relevant departments of each institution that were involved with portfolio assessment and then reaching out to staff via email to inquire about their willingness to participate in an interview. Potential interviewees were sent a document with information regarding the aims of the study so that they could make an informed decision about their participation.

The snowball sampling strategy was used after obtaining an initial interview with an expert in each program. This was especially useful after contacting staff in the relevant departments who had firsthand knowledge of teachers they were connected with in the program that they knew used the portfolio assessment system since this information was not always easily accessible from publicly available information.

Brief Description of Chosen Cases

Case 1: Eötvös Loránd University (ELTE) Teacher Education Program

Eötvös Loránd University (ELTE) was initially founded in 1635 by Cardinal Péter Pázmány in what is today Trnava, Slovakia with two faculties, that of humanities and theology. The university was moved to Pest in 1784. It opened Europe's first Teacher Training School in 1872 after previously establishing the State Teacher Training Institution in 1869. It adopted its current name in 1950 in honor of the renowned Hungarian physicist Eötvös Loránd. The Faculty of Education and Psychology, the main faculty branch used in this study, was founded in 2003 (Brief History of ELTE, n.d.).

The primary reason why ELTE ITE was chosen is because it makes for a useful example of a blend of macro-level and meso-level portfolio assessment owing to the fact that an induction process in which teacher portfolios are assessed is according to national directives (macro-level) while different institutions interpret the requirements behind this portfolio assessment differently and therefore implement a system that would more accurately be described as meso-level (Symeonidis, 2017). Given that the portfolios have the strict purpose of demonstrating competences, this case study also represents a positivist approach to portfolio assessment since portfolios are assessed based on standards externally determined by the government in the hopes of creating a highly standardized model of compliance. Given the prominence of ELTE in teacher

education in Hungary, it also seemed like the most appropriate choice of institution in which to observe how such standards are implemented.

Case 2: CHARM-EU Master's in Global Challenges for Sustainability

The CHARM-EU program was chosen primarily because of its uniqueness in the field of higher education as a program that lacks a singular "brick and mortar" institution but instead it involves staff and students from a variety of countries, institutions, and disciplines. Furthermore, it makes for a particularly strong example of the constructivist approach to portfolio assessment through its philosophy of utilizing programmatic assessment across multiple modules and three phases (CHARM-EU, 2021).

This program was also relatively recently established and so it maintains a strong dedication to constant innovation and reflection about its current teaching and learning practices. These factors made it an ideal choice, particularly when interviewing candidates about the continuing development of portfolio assessment.

Case 3: Dublin City University (DCU)

DCU was chosen as a case because it has a robust digital portfolio program in place that is available for all of its faculty and students. It had over 19,000 registered users and almost 9,000 active users of this program as of the 2019/2020 academic year after its initial launch in 2016 and formal launch in 2017. This digital portfolio program is now incorporated into over 50 programs at DCU and continues to be supported and developed each year with seminars and other events to instruct others on the best practices of portfolio assessment (*Learning With ePortfolios*, n.d.).

DCU was also chosen due to the fact that it represents both meso-level and micro-level portfolio assessment implementation since the portfolio system was initially established following an institutional directive to implement the program in DCU's 2012-2017 strategic plan and yet how the system is utilized is still largely determined by voluntary implementation by lecturers as part of their teaching modules. The latitude with which teachers of diverse subjects decide to employ the portfolio system for their modules means that classifying the overall system as fitting within either paradigm is difficult, but successful examples of portfolio assessment implementation generally demonstrate a much more constructivist approach (2021). This makes DCU a useful example for its unique system that makes for rich comparison to the other two cases.

Context of Cases

The Hungarian Higher Education System's Context for Portfolio Assessment in the ELTE Teacher Education Program

Kopp and Kálmán (2023) wrote a very insightful piece about how teacher education, as a part of teaching and learning in higher education, has been and is currently operated in Hungary. The authors provided an overview of how education in Hungary has developed over the past century with most emphasis on its development since Hungary's emergence as a democratic state in 1989. Tracing these often sudden, radical changes in educational policy that were almost always performed without the consultation or consent of the professionals involved highlighted both the ongoing struggles still facing Hungarian educational policy along with the system's minor, yet increasingly infrequent victories over these decades. In terms of contributions to the current study, Kopp and Kálmán's work was most important for informing this study of the lack of professional autonomy involved in teacher education in Hungary along

with the ineffective and frustrating tensions between different levels of administration, different departments, and in the methods of assessment of teachers and students. While not the focus, this source also briefly mentions how portfolios are used in the final year of Initial Teacher Education (ITE) for the assessment of prospective secondary school teacher competences. For these reasons, this source has been highly relevant and useful to this study (Kopp & Kálmán, 2023).

Another enlightening source on the Hungarian educational system is the work by Chrappán et al. (2020) that succinctly explains the need for itself and other readings about the Hungarian ITE system in its introduction when it states that, "understanding the context is indispensable to reveal the nuances of any teacher education system" (p. 50). Much like Kopp and Kálmán, Chrappán et al. address the historical and current challenges facing the Hungarian ITE system along with the attempted remedies and regrettable setbacks that created greater tension and frustration in the system as a whole. In addition to this added perspective, this source's main value to this study is in its more detailed coverage of portfolios as a proposed practice-based assessment tool (Chrappán et al, 2020).

Chrappán et al. (2020) also fortunately go into great detail about portfolio assessment in the Hungarian context. For example, the work explicitly quotes and, thankfully, translates the Hungarian educational policy change of 2013 which states the prospective benefits of portfolio assessment: "…the portfolios aim to prove that students are capable of self -reflection, integrating and applying the knowledge they acquired during teacher education, and evaluating the relevant scientific literature and the effectiveness of their teaching and/or pedagogical work" (p. 65). The authors go on to explain the hoped for-benefits of the portfolio as a tool, benefits that it mentions in common with several other documents such as offering alternative methods for assessment, developing reflective writing skills, offering innovative learning culture and support, developing digital literacy, aiding students in seeking employment, representing a merging of theory and practice, and others. A final contribution taken from this article is that the work reiterates what other sources say about the extremely varied nature in how portfolio assessment is implemented across different ITE programs and institutions in terms of what types of submissions in what ratios are required and which are voluntary, in terms of what intended roles the portfolios play, and in terms of who evaluates the portfolios whether that be an assessor from the university of the ITE program or an assessor from the school where the ITE student has been placed (Chrappán et al, 2020).

Symeonidis (2017) is another author who helped inform this study of the context of the Hungarian educational environment by tracing its development alongside broader EU educational trends and the often insufficiently nuanced way that European policy ideas and changes were "translated" or "downloaded" to a Hungarian context without regard for how to embed such policy changes within the existing cultural, political, and educational environment of Hungary. Interviews he conducted highlight an often shocking lack of coordination at different levels of the Hungarian higher education system in how these broader European policy initiatives such as Continuing Professional Development (CPD) resulted in widespread confusion over not only which levels of the system were responsible for implementation and accreditation but also over the terminology itself. To demonstrate this, he cites one interview example that mentioned how CPD was seen as an artificial term when translated into Hungarian and thus resulted in an ambivalence in teachers towards CPD because it was more seen as an obligatory hurdle towards advancement than an opportunity and thus seemed like a further burden on teachers who already felt strained

by their existing responsibilities. This situation was again complicated by the fact that only CPD which is linked to special examinations, decided by the Minister of Education, can result in career advancement rather than teachers' existing professional merits, especially those gained from non-formal and informal contexts. In-service training programs for CPD likewise demonstrate a lack of coordination where individual departments of institutions could submit applications for the accreditation of these programs without deans or rectors even knowing about these applications. This source was thus instructive overall about how difficult it would be for a program in Hungary to successfully implement portfolio assessment when there is such turmoil over how teachers would be involved in the training necessary for their successful implementation (Symeonidis, 2017).

Symeonidis (2019) later did further research into the Hungarian higher educational system as it related to teacher competence frameworks, another idea initially introduced for the sake of conforming to European educational policy. The implementation of a competence framework for teachers has not defied this unfortunate trend, with the top-down framework established in the educational policy change of 2013 causing further ambivalence among teachers who either felt that it was overdeveloped and thus not easily implemented or otherwise that it was ineffective at filtering out unqualified teachers. The fact that the competence framework was developed by a restricted panel that was selected by the government without any kind of collective bargaining with teacher unions, nor any kind of impact evaluation, nor any consultation with professional organizations of teachers, makes resistance to this policy among teachers understandable (Symeonidis, 2019).

Another result covered by Symeonidis (2019) is that, in CPD, the outcome competence frameworks of teachers and student teachers are very similar to each other. The most relevant aspect of this article by Symeonidis He investigated how this same policy change that resulted in the unsuccessful implementation of competence frameworks also resulted in an unsuccessful implementation of portfolios to assess these competences among teachers. For example, the initial step of this implementation process was the classification of all teachers as "Teacher I" status, regardless of experience, and required them to submit a digital portfolio to a national platform in order to advance to "Teacher II" status and receive the concomitant salary increase. That teachers with more years of experience found this degrading is small wonder. While younger teachers seemed to utilize the portfolio system for intended purposes such as reflection and view it as promoting greater professionalism, others already frustrated by the confusion resulting from hasty government policy implementation naturally regarded it as a tool for the government to further reduce their autonomy. This article lends further evidence to how new policies, even those that are well-meaning and inspired by successful implementation in other countries, can lead to tumultuous and unsuccessful implementation in countries like Hungary where sensitivity to institutional and national contexts is lacking (Symeonidis, 2019).

Taken together, the insight granted from the authors listed above demonstrates well what kind of reactions and impact macro-level, positivist implementation of portfolio systems can have.

Portfolio Assessment in CHARM-EU

The acronym of CHARM-EU represents, "a Challenge-Driven, Accessible, Research-based and Mobile model for the co-creation of a European University aligned with the European Values, the European Green Deal and the sustainable development goals (SDGs)" (*CHARM-EU | Who We Are*, n.d.). It is a unique case in that it is not a

single institution nor a product of a single institution, but rather it is a university alliance striving to create a new university model that can be an example to the world while supporting continuing development, competitiveness, and innovation in the European Education Area (*CHARM-EU Mission and Vision Statement*, 2022). The alliance was initially created in January 2019, and the current members of the alliance, with the University of Barcelona as the coordinator, are Trinity College Dublin, Utrecht University, the University of Montpellier, Eötvös Loránd University Budapest, Åbo Akademi University, Julius-Maximilians-University Würzburg, and the Ruhr West University of Applied Sciences. Its 18-month degree program, Master's in Global Challenges for Sustainability, accepted its first students in September 2021 and it has continued ever since (*CHARM-EU | Who We Are*, n.d.).

According to its mission statement, the CHARM-EU program has five goals for its vision of achieving the status of an educational exemplar that reflects a truly innovative model with its basis in the heritage of the European higher education traditions. The five goals are fairly detailed, but they will be covered here in brief. The first goal is incorporating the best practices of the European higher education landscape to provide learning experiences that are highly mobile, transformative, and widely accessible. The second goal is to lead the future of European universities by example in the way that CHARM-EU strives for new models of teaching that focus on student-centered learning and autonomy in a way that integrates research and enquiry skills. The third goal involves challenge-based learning focused on environmental concerns and digital transformation via ethical research in accordance with the UN's Sustainable Development Goals. The fourth goal is to continually expand involvement in the CHARM-EU program with more member staff and to support the professional development of staff. The final goal is to intensively strive for stronger connections between research and education in a way that encourages others to emulate its innovative methods and successes (CHARM-EU Mission and Vision Statement, 2022).

Given this strongly holistic and constructivist approach to innovation and portfolio assessment implemented at the meso-level, the Master's in Global Challenges for Sustainability program of CHARM-EU represents a firmly unique case of using portfolio assessment in a higher education program.

Portfolio Assessment at DCU

Dublin City University began its status as a university and admitted its first students as a university in 1989, making it a relatively young university (*Dublin City University | Irish Universities Association*, 2022). Previous to attaining university status, DCU had been known as the National Institute of Higher Education (NIHE) Dublin and had the focus of developing the technical skills of Irish higher education graduates. As the NIHE Dublin, it had first accepted 191 students in 1980 to address this perceived deficit of technical skills, a deficit that had become apparent from review of the existing higher education institutions in Ireland of the preceding decades. Since these beginnings, DCU has grown to currently have over 19,000 students across three campuses from a wide range of countries and has developed a very strong reputation, particularly for its focus on accessibility, community engagement at levels ranging from local to international, and embrace of academic innovation (*New Book Chronicles the 40 Year History of Dublin City University*, n.d.). It is this attitude towards continuing academic innovation that has made it stand out from many other universities not just in Ireland but also in Europe.

The portfolio system at DCU was first called for in its 2012-2017 strategic plan before being initially implemented at the pilot level in September of 2016. The portfolio system that was chosen for implementation was a digital portfolio system that made use of the open-source, web-based portfolio management system called Mahara. During the pilot year of implementation, this portfolio system was used by a wide variety of different disciplines and within different contexts and was able to achieve around 5,200 total users at DCU by the end of this year. The success of this portfolio system's implementation and development continued after its formal launch in the 2016/2017 school year to then include more than half of the entire student population with over 10,000 registered users at DCU. By 2019, this portfolio system continued to grow to 15,000 users as it incorporated not only more students but also DCU staff. This resulted in DCU having the largest institutional implementation of a digital portfolio system out of any higher education system in Ireland by 2019 (Donaldson, n.d.).

Experienced practitioners and advocates from DCU even carried their ardor for this digital portfolio system to a broader level when they founded EportfolioIreland (originally called MaharaIRL) in 2017. EportfolioIreland was originally a core group of staff from DCU that, by its first meeting, grew to incorporate expert enthusiasts from seven different higher education institutions across Ireland for the sake of collaborative learning and sharing best practices for all aspects involved in digital portfolio systems, assessment included. This first meeting of EportfolioIreland was held on April 27, 2017 with more than 25 participants. The following year, an "unconference" was held by this organization to specifically talk about the practice of portfolio assessment and collaboratively develop the "Holy Grail of Rubrics" for the purpose. The organization and its members have since collaborated with higher education institutions and professionals not just in Ireland but also in other countries as far away as Hungary, Vietnam, and Australia (Donaldson, n.d.). EportfolioIreland still currently exists and held its most recent event that was an online workshop on ethics in digital portfolios on October 25, 2022 (*Eportfolio Ireland*, n.d.). In this way, the positive attitude towards portfolio systems and their development has not just affected students and staff at DCU but also the wider higher education landscape of Ireland and beyond.

As for the practice of portfolio assessment at DCU specifically, portfolio assessment has been used across more than 30 different programs. Teachers at DCU have used portfolio assessment in an impressively diverse set of modules, these modules ranging from psychology to education to nursing to athletic therapy and even to aviation. Although ample guidance has been provided by the relevant supporting department, each of the teachers that has chosen to use the DCU portfolio system for assessment has implemented it a way that is unique to their modules. These implementations have usually included an emphasis on reflection, but otherwise these uses of portfolios for assessment have varied to include assignments such as creating case studies, giving presentations, doing literature reviews, creating campaigns to address health inequities, and many other assignments depending on the teacher . For initial teacher education programs at DCU, however, the Teaching Council of Ireland has, as of 2020, mandated that portfolio-based learning be a part of the curriculum (Donaldson, 2021).

Clearly, the success with which a portfolio system and its use in assessment was implemented and developed at DCU make it a worthwhile case study to explore. Observing what elements were most crucial to its success and what obstacles it has had to overcome since its initial implementation will ideally be constructive for other programs that would like to emulate its achievements.

Data Collection Strategy

General Strategy

Publicly published information documents were collected and educational professionals were interviewed using a semi-structured interview protocol. The initial search for documents involved investigation of the relevant websites for each case. These websites had varying levels of availability of information but were usually sufficiently transparent about the portfolio systems and assessment procedures that have been implemented as part of each program. When documents were not freely available or otherwise not adequate in the amount of information they offered for the purposes of this study, then interviewees were asked if they could provide additional documents that would further elucidate the topic.

The initial procedure for arranging interviews began when information about this research and an interview guide was sent to potential interviewees in advance to let them decide whether to participate in the research. They were able to ask any questions regarding the research, and their questions were answered fully to the best of the researcher's ability. Once they agreed to be interviewed, the researcher kindly asked them to sign or another acknowledge the reception of the research consent and ethical permissions form. Ethical permission to conduct the interviews for this study was applied for prior to seeking out interviews and successfully granted by the Research Ethics Committee of the ELTE Faculty of Education and Psychology on February 23, 2023 with a validity period from that date until June 30, 2023. The license number for this granted ethical permission is 2023/100.

Upon participants' reply and consent, a date and place was confirmed to conduct the interview. Considering potential logistical constraints, virtual interviews (via Microsoft Teams) were usually arranged. In cases where the interviewee preferred to, or it was not feasible to set a date, the option of a written interview was offered and chosen by one interviewee. Interviews most commonly lasted around 60 to 90 minutes.

Questions were divided into two separate sets of interview questions with the first set being for academic professionals (university teachers and directors) and a second set being for administrators. The questions in these two guides that were seen as most fitting for this research can be found in Appendix 1.

In terms of data analysis, the transcripts were imported to and formatted in Atlas.ti and a simple classification system was be developed to conduct inductive analysis. Each interviewee was assigned a number rather than a name in the process to protect confidentiality. Useful data that was not immediately clear from the inductive analysis of Atlas.ti was then gathered using holistic analysis to discover trends and themes among interview responses. This data was then separated into different levels to see if there are common similarities between all the levels or disparities that can perhaps be investigated as to the causes of their differences.

Case 1: Eötvös Loránd University (ELTE) Teacher Education (TE) Program

A total of three interviews were conducted with representatives from the ELTE case study. The interviewees consisted of teachers as well as administrators. These interviews primarily made used of an expert sampling procedure where many different potential participants were contacted via email to inquire about their willingness to participate in interviews. Language barriers represented an obstacle to the participation of some experts that did not feel comfortable engaging in in an extended interview taking place entirely in English. In situations where experts were willing to participate but considered the language barrier to be an obstacle significant enough as to prevent

their clear expression of their ideas, the option to submit the interview guide back with translated responses was offered. One interviewee preferred this method of response and their responses were gratefully accepted. Two other experts affirmatively responded to emails and agreed to verbal interviews. These interviews took place over Microsoft Teams and were recorded via the transcription function of the Teams software. Manual transcription by the researcher in a separate document was performed concurrently in case the transcription software had errors in its function.

Documents for this case mostly took the form of academic articles written by ELTE professors both current and former about nationally mandated portfolio assessment as part of teacher education and the effects this mandate has had on all Hungarian higher education institutions that have teacher education programs, generally, and also on the ELTE Faculty of Education and Psychology, specifically. Aside from these articles, an interviewee was also able to provide a previous and current version of the assessment rubric used for portfolios in the teacher education program. These documents were analyzed together to get a clearer picture of how the portfolio assessment process occurs in this case.

Name of Data Source	Type of Source	Role of Source
Interviewee 1 (I1)	Interview	ELTE Teacher
Interviewee 2 (I2)	Interview	ELTE Teacher
Interviewee 3 (I3)	Interview	ELTE Professional Director
Article by Chrappán, Kopp, & Pesti (D1)	Document	Initial Teacher Education Policy in Hungary Issues Info
Symeonidis Article 1 (D2)	Document	Hungarian Teacher Education in European Context Info
Symeonidis Article 2 (D3)	Document	Hungarian Teacher Competence Development Info
Article by Kopp & Kálmán (D4)	Document	Hungarian Teacher Education Policy, Govt vs Autonomy Info
TE Portfolio Assessment Rubric (2022) (D5)	Document	Structure of Portfolio Assessment in TE at ELTE Info

Figure 3: Sources for Data Collection from ELTE TE

Case 2: CHARM-EU

A total of two interviews were conducted with representatives from the CHARM-EU case study. Given the fact that many people involved in CHARM tend to function within multiple roles related to teaching as well as administrative work, this was considered sufficient for granting insight into the program's portfolio assessment system from the perspective of multiple roles. Interviews here were primarily arranged using a snowball sampling strategy following an initial expert sampling strategy that involved contacting an expert that was currently working at ELTE but had experience from being a part of the CHARM program. This expert was contacted via email and was able to offer their recommendations and contact info for other experts still currently involved with the program. This information was used to reach out to these potential interview subjects, two of which agreed to participate in verbal interviews via Microsoft Teams. Once dates were arranged, these interviews took place and were recorded using the transcription function of Teams. Manual transcription by the researcher in a separate document was performed concurrently in case the transcription software had errors in its function.

It was beneficial to this study that this case had a wealth of publicly available documents on its website regarding nearly every aspect of the program, portfolio assessment included. These resources are made transparently available to all potential students, teachers, advisors, and stakeholders so that they may have a clear grasp of the procedures and philosophy that constitute the Master's in Global Challenges for Sustainability degree program. Given the recency of the program's establishment, there were not as many academic articles on it aside from newsletter articles but there was also little need for such articles given how many resources are available on the program's website in either pdf format or simply listed on the web-pages. The abundant information in these resources helped to fill any potential gap that may have been left by having one fewer interviewee for this case.

Name of Data Source	Type of Source	Role of Source
Interviewee 4 (I4)	Interview	CHARM-EU Portfolio Assessment Committee Member
Interviewee 5 (I5)	Interview	CHARM-EU Portfolio Assessment Committee Head, Program Developer
CHARM-EU Pedagogical Guidelines (D6)	Document	CHARM-EU teaching and learning best practices, theory, guidelines for teachers
CHARM-EU Program Content Guidelines (D7)	Document	CHARM-EU Info on Curriculum Design, Educational Program Content
CHARM-EU Assessment Techniques & Criteria (D8)	Document	CHARM-EU Info on the planning, design, and implementation of assessments in modules
CHARM-EU Student Handbook (D9)	Document	CHARM-EU Info Provided to Students of the Program

Figure 4: Sources for Data Collection from CHARM-EU

Case 3: Dublin City University (DCU)

A total of three interviews were conducted with representatives from the DCU case study. All three interviewees had experience in an administrative capacity at DCU, and so one of the interviewees that also taught a module utilizing portfolio assessment was asked to primarily give his perspective from a teacher's point of view. Interviews here were also initially arranged using an expert sampling strategy in which experts of the relevant department of DCU most involved with the maintenance and development of the portfolio system were contacted via email. This strategy was successful in scheduling two interviews with experts who agreed to participate in verbal interviews over Microsoft Teams. During the second of these interviews, the participating expert offered to contact an erstwhile coworker who had been instrumental in the implementation and development of the portfolio system at DCU. In this way, a snowball sampling strategy was then used to arrange an interview with this expert who also agreed to participate in a verbal interview over Microsoft Teams. For all three of these interviews, the transcription function of Teams was used to record the conversations. Manual transcription by the researcher in a separate document was performed concurrently in case the transcription software had errors in its function.

Due to the exuberance with which a portfolio system had been implemented at DCU, there was a rich amount of documents that had been created over the years since the implementation and all of these documents were publicly available online. Some of

this information could be accessed directly from the website of DCU while a multitude of other documents, particularly ebooks, were also available via other websites that were linked to from the official website. These ebooks helpfully presented not only overviews of how portfolio assessment has been implemented at DCU but also many individual testimonials from teachers that had used the system in the modules that they teach. Taken with the interviews, all of this data presented a very clear picture of the implementation and development of the portfolio system and how it has been used for assessment at DCU.

Name of Data Source	Type of Source	Role of Source
Interviewee 6 (I6)	Interview	DCU Administrative Staff
Interviewee 7 (I7)	Interview	DCU Administrative Staff and Module Teacher
Interviewee 8 (I8)	Interview	DCU Former Administrative Staff
Learning with ePortfolios Web Page (D10)	Document	Overview of the Portfolio System at DCU
Eportfolio Based Assessment (D11)	Document	Ebook on Successful Examples of Portfolio Assessment at DCU and other HEIs
Eportfolio Implementation Plan (D12)	Document	Template Created by DCU Professor for the Implementation of Portfolio Assessment Systems
Exemplars of DCU Best Practice with Eportfolio Based Assessment (D13)	Document	Ebook with Successful Examples of DCU Professors Implementing Portfolio Assessment Systems

Figure 5: Sources for Data Collection from DCU

Data Analysis Strategies

General Strategy

Analysis of the data was performed using an inductive, qualitative content analysis approach after collecting enough data using the previously mentioned sampling strategies. Content analysis is defined as, "a research method for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action" (Elo & Kyngäs, 2008, p. 108) The same authors describe inductive analysis by explaining that, "An approach based on inductive data moves from the specific to the general, so that particular instances are observed and then combined into a larger whole or general statement" (Elo & Kyngäs, 2008, p. 109).

Prior to collecting or analyzing data, research questions first needed to be formulated based on the topics sought to be explored. The reasoning behind the formulated questions and chosen topics are explained above in the methodology section.

After this formulation and choosing, the first step conducted in the analysis was deciding on what unit of analysis to use. Given that the documents and interview transcripts were not lengthy enough so as to warrant judgment or probability sampling, the unit of analysis chosen was that of whole interviews and whole documents. Only the manifest content of the documents and transcripts was chosen for analysis for a few

reasons. For the documents, the reason was that they were usually explicitly written about the topics that were being researched and thus required little further interpretation in order to elicit meaning. For the interview transcripts, observing the manifest content was chosen due to the fact that many interviewees did not speak English as their native language and so attempts to analyze latent content such as hesitations, moments of silence, laughter, and other signals could result in misattribution of these signals to ulterior meanings that may simply be explained by native language differences. Furthermore, all the experts interviewed are very familiar with the process of portfolio assessment and able to speak frankly about it, causing little need to seek further meaning from their responses on the topics.

After the unit of analysis was decided on, open coding was performed on the documents and interview transcripts. Traditionally, open coding, "means that notes and headings are written in the text while reading it" (Elo & Kyngäs, 2008, p. 109). Given that all of the data was in digital format, this procedure was instead performed using the Atlas.ti software. Documents in the form of web pages and ebooks were converted to pdf format before being uploaded to Atlas.ti alongside the other documents and interview transcripts. The coding function of Atlas.ti was then used initially for open coding, then group (also known as axial) coding was performed on all of the data sources in order to organize data into higher order categories. Elo & Kyngäs (2008) describe the purpose of this group coding as, "to reduce the number of categories by collapsing those that are similar or dissimilar into broader higher order categories…to increase understanding and to generate knowledge" (p. 111). The strategies employed for use in open coding and group coding are detailed in the following sections.

Coding Strategy

This study took an exploratory/descriptive approach. All of the documents and interview transcripts detailed in the previous figures of the data collection section were initially coded using an open coding procedure that had the primary intent of noticing repeated patterns in interview responses and document text, especially if these patterns pertained to the research questions of this study. Codes were chosen once it was apparent that an idea was emphasized through repetition in all of the data and then these codes were used to observe comparisons and contrasts between the different data sources. After the initial open coding was performed, a second round of open coding then took place to ensure that chosen codes were applied uniformly across all data sources, especially in cases where codes were created after several data sources had already been reviewed.

An example of this procedure in open coding is the specific code of "student-centered learning" which arose often in documents and interviews either as a stated intent for introducing a portfolio assessment system or as reasoning behind the assessment process. The code was applied to data that mentioned ideas such as a focus on students' personal development, greater accessibility to the assessment process for students, or preparedness for their future growth in their learning and career, especially in comparison to traditional assessment methods. An example of text that this code was applied to is, "multiple means of engagement – the assessment was personalised to allow the student to take ownership of their learning and therefore meaningfully engage with the assessment process" (Donaldson 2021, p. 16). Another example this code was applied to was text from the transcript of the interview with I4:

> I don't do exams and I don't do tests, I do projects, and I want to make sure I'm motivating the students to show what he or she has inside and is able to

> give some added value to the project. So there's only encouragement during the process. Making sure that those who want to I'm supporting them to do whatever their role was. But they are free to choose. (Interview, I4).

The expression "student-centered learning" was also used explicitly in some of the data, to which the code was easily applied.

Another example was the code, "implementation process of portfolio assessment" which was focused on when interviewees or documents mentioned the beginnings of the assessment system as part of their module, program, or institution. Some data from an interview that this code was applied to is as follows:

> First step I think we made a list of documents what students can put in the portfolios, the different subjects, products, documents and so on, what students can put in. That was the first step, it's not mandatory but they can choose from this list. It was a huge huge discussion about that, what has to be there to demonstrate competences. For example, not enough to put only internship docs but also previous materials… (Interview, I2)

As with the previous example, there were also examples of data that explicitly mentioned the "implementation process" to which this code was applied.

After open coding, group coding then performed to organize the observed data into broader categories that would provide insight for answering the research questions of this study. The broader topics that into which the open coding data were grouped into were the stated perspectives and opinions that were being given on portfolio assessment systems (i.e. students, teachers, or administrators), the steps of portfolio system implementation and development in each of the cases, the support and preparation offered to students and teachers involved in the portfolio assessment process, the methods and theory or purpose behind the different systems of each case, the benefits and challenges experienced through usage of each system, and the future directions of each respective system along with recommendations that stakeholders from each would give for continuing development of portfolio assessment programs or their initial implementation in other programs.

An example of how codes were then grouped together is the coding group "RQ1: Benefits and Reasons for Implementation." Six individual codes were placed into this group due to their perceived connection with answering the first research question of this study. The six individual codes that were placed in this RQ1 group were 1) Complex Assessment, 2) Compliance Assessment, 3) Hoped-for Benefits of Portfolio Analysis, 4) Observed Benefits of Portfolio Analysis, 5) Student-centered Learning, and 6) Transdisciplinary Perspective.

Another example of categorizing prior codes was the group "RQ2: Challenges and Support Offered/Required for Portfolio Assessment." Four individual codes were placed in this category due to their perceived connection with answering the second question of this study. The four individual codes that were placed in this RQ2 group were 1) Challenges of Portfolio Assessment, 2) Student Support with Portfolio Assessment, 3) Teacher Preparation for Portfolio Assessment, and 4) Teacher Support for Portfolio Assessment.

Data Analysis Results

Eötvös Loránd University Teacher Education (ELTE TE) Program

Main Steps of Implementation

As stated previously, the implementation of portfolio assessment in teacher education programs was first mandated by the government in 2006. Though the

government mandated such a system in its policy, it appears to have been initially introduced by academic experts at ELTE and likely at other institutions as well before it became required. I3 recalled this time and how the process affected teacher education at ELTE, even though ELTE had previously been working on incorporating portfolio development into its teacher education program:

> We at the ELTE Faculty of Pedagogy and Psychology have been pushing for this. At the time of the Bologna Process transition (2005-2006), we still had some influence in the field of professional policy, and as a result it was included in the regulations. A serious obstacle was the fact that those involved in teacher education did not, and still do not, agree on the main objectives of the training, nor on the forms of assessment, including the role of the portfolio. …At the university level, the first step was taken after the regulation came into force, but within the Faculty we had already been working on the portfolio as a new option. After its introduction, the planning in the university consultation bodies was initially limited to deciding formal issues: who would evaluate, the interface for uploading, how many credits… (Interview, I3)

This response demonstrates that the first step in the implementation of a portfolio assessment system at the institutional level is the formal planning of its details by involved stakeholders, but that that the stakeholders often have differing views on these details. Disagreements among colleagues regarding these details seemed to continue for years and are still somewhat unresolved today both within institutions and between them (Chrappán et al., 2020; Interview, I2, I3).

The system is primarily evaluated based upon how well it helps prepare teachers for their future or continuing careers. The national curricula of teacher education changes often due to the ongoing discussions about how well these curricula actually equip teachers with the necessary skills and competences they need in the roles they will fulfill in their careers (Chrappán et al., 2020). At this level, the system appears to be successful, even if it has not succeeded in all that was hoped of it such as as being more accessible or inspiring student teachers to use portfolio assessment in evaluating their own students in the future (Interview, I2).

Hoped-for Benefits of Implementation

The following table provides an overview of hoped-for benefits mentioned in data from the interviews and documents. These benefits are numerous and so each is mentioned in brief. The benefits that were hoped for with the implementation of portfolio assessment likewise differed among stakeholders. Nationally, the perspective was that "the portfolios aim to prove that students are capable of self -reflection, integrating and applying the knowledge they acquired during teacher education, and evaluating the relevant scientific literature and the effectiveness of their teaching and/or pedagogical work" (Chrappán et al., 2020, p. 65). Teachers at ELTE meanwhile have held many hopes that the system might, for example, make teacher training more coherent, that it would better prepare students for their teaching careers than a thesis might via authentic assessment, and that it might be a more accessible form of assessment (Interview, I2, I3).

Hoped-for Benefits of System (ELTE TE)	Source	Relevant Sample Quotation
Give insight into the professional learning process	I3	"It gives insight into a professional learning process"
Allow for detailed or complex	I2, I3	"So for example bigger documents, project

assessment		plans, and unit plans where there are different lessons, like here is one very complex lesson, and they reflect on that"
Include aspects that value development and change	I3	"It also includes aspects that value development and change."
Help make training more coherent	I3	"I was hoping that this would be an element that would help make the training more coherent, but just as having children doesn't solve a marriage, this was not the right thing to do"
Track and reflect on student teachers' progression	D1, I2	"what can be supported with portfolio learning, for example you check the competencies, what you should develop during your program, and then you think about that, OK, I see where I develop this competence, but perhaps another I have to develop myself"
Prepare student teachers to conduct research	D1, I1, I2	"giving them info is important, how they find the info. I also need to give them names, research methods, some thinkers, so we can orient them into the materials. But we don't need to teach them everything"
Encourage student reflection	D1, D2, I2	"We have a course in the teacher education program, and the most important aim of this course, is to support students to develop their own portfolios, and to develop reflections on their portfolios."
Prove students can integrate and apply the knowledge they acquired during teacher education	D1	"According to the national regulations, the portfolios aim to prove that students are capable of self -reflection, integrating and applying the knowledge they acquired during teacher education and evaluating the relevant scientific literature and the effectiveness of their teaching and/or pedagogical work"
Prove students can evaluate relevant scientific literature and the effectiveness of their teaching and/or pedagogical work	D1	Same as above
Develop of nationally defined teacher competences, ensure compliance with national standards	D1, D2, D5, I2	"A common use of this competence framework is to integrate it as a fundamental part of the portfolio, where student teachers are expected to reflect on their readiness for teaching along with the competence fields by presenting various documents and reflections."
Develop critical thinking skills through engagement with different perspectives	I1	"Influencing their way of thinking is the most important thing in the university. If we do that, that is the best thing. So if you are an intellectual, you need a different way of thinking than others. For me, that is having different views"
Develop student teacher autonomy	I2	"The aim is to give an opportunity for students to demonstrate their competence development… that they are planners, able to do things autonomously"
Demonstrate teaching skills	I2	"I see this portfolio is a good opportunity for them to demonstrate really their teaching skills. From my perspective as an evaluator, it is much more convincing that they are teachers when they finish their studies."

Be an easier assessment for student teachers than a thesis	I2	"So there was some ideas behind that for example it would be easier for student teachers to prepare portfolios instead of thesis"
Authentic assessment to prepare student teachers for their career path, assist in career development	I2	"The other thing was that they would be prepared for their career path as a teacher. It's good, it's through. So we prepared them for a career long assessment and they are prepared for that"
Encourage student teachers to assess their future students with portfolios	I2	"We also thought that student teachers in a later period as teachers they will use portfolio for evaluating their students as well."

Figure 6: Hoped-for benefits of ELTE TE Program

Preparation and Support for Teachers with Portfolio Assessment

Although some preparation and support for teachers of the ELTE TE program does exist, it appears to be fairly minimal and, as a result, many teachers end up independently supporting and preparing themselves for portfolio assessment. As it currently exists, teacher preparation for adherence to national standards of portfolio assessment seems to be the most lacking. One interviewee that has had experience with the national system since it was first mandated had the following perspective on how they believe the implementation process should occur:

> In no way would I start from a portfolio evaluation system, but I would put the development of a coherent training programme with clear objectives first. Then, in doing so, I would interpret the nationally defined learning outcomes within the training programme. I would develop a learning support system and link the elements of the evaluation to it. And the preparation of the portfolio would be a key element. (Interview, I3)

This same interviewer mentions that they were mostly self-taught and prepared for portfolio assessment via reading rather than through any kind of official support. Within ELTE itself, however, there is more support at the meso-level of portfolio assessment where teachers that may be struggling with the system have access to common training materials such as a tutor's guide on the most recent assessment rubric of ELTE TE and are able to schedule personal consultations to have their specific questions answered by more experienced staff (Interview, I3). Other staff have also noted that there is at least support from colleagues even if there is not much support otherwise (Interview, I1) Overall, this lack of assessment training has resulted in some assessors that are not themselves involved in teacher training and therefore tend to be overly rigid in their approach to portfolio assessment (Interview, I3).

Even though there are efforts from colleagues to be supportive of other teachers, many teachers still feel frustrated or that there is a lack of fairness involved in portfolio assessment procedures such as in how the assessment tasks are distributed or how teachers do not feel the extra time and effort required for performing these tasks is acknowledged. One interviewee had the following experience:

> Those that are teaching in teacher education, most of them are happy with this portfolio assessment, only some of them are not so happy because evaluating portfolios is a huge work, much bigger than evaluating a thesis. Somehow it's not shared among teachers in a fair way. You know some teachers should evaluate 20, it's 3 weeks you don't do anything else, only reading portfolios, and it's not a humanistic way of using workforce. So no more than 5 is allowed for one teacher because then it is too much, it's too much. You get bored with them, and it's not good. (Interview, I2)

The fact that the maximum amount of portfolios to be reviewed by a single assessor has been reduced does represent progress, but requiring more assessors also would require more support and preparation. The way this same interviewee feels about the overall institutional support for the process is demonstrated by the following quote:

> I think that although the university, ELTE always declare the most important field in the program at the university is teacher education but it's only at rhetorical level... I think the board of the university didn't consider teacher education issues but that is the biggest part of the university portfolio... teacher education is more pragmatic, something they are not interested in. (Interview, I2)

Another ELTE interviewee echoed the same sentiment when they lamented that, although there is still a shrinking group of people who are dedicated to teacher training, the growing consensus that teacher training is a low priority means that there are not many who remain committed to training teachers (Interview, I3). Overall, the general perspective on teacher support and preparation for ELTE TE seems to be that there are many well-meaning individuals involved to offer support, but this support is not often explicitly prescribed or provided at the meso- or macro-level and so many teachers are left frustrated with their roles as portfolio assessors.

Future Trends and Directions

"It will continue because it is a mandatory element in national legislation" succinctly addresses that portfolio assessment will certainly continue at the national level and therefore as part of ELTE TE, though its inextricable ties to politics make the precise manner in which is will continue difficult to predict (Interview, I3). At the institutional level of ELTE, at least, there is a Faculty's Teacher Training Committee that has been preparing for an updated evaluation system more focused on learning outcomes over mandatory document types (Interview, I3). This shows that in the case of macro-level implementation, there is still the possibility for minor remedying of such policies at the meso-level.

Other teachers of the ELTE TE program see portfolio assessment expanding beyond the field of education into other disciplines and other countries. As the second interview put it:

> I think it could influence further development that portfolio assessment is more and more popular in the world. When more people have experience with it then it's more popular in a program as well. When students have to use it after grad when looking for a job then it's really good when they still have this collection we can say that demonstrates their skills. I think this process and growing importance will influence a lot, and thinking about portfolio in a program (Interview, I2)

This perspective demonstrates that even if participants may find the implementation of portfolio assessment to be flawed or improperly supported, many still support and believe in it as a concept worthy of greater adoption. Perhaps the idea of portfolio assessment itself will indeed be strong enough to overcome any faults in the manner of its implementation, though this evidence seems to point to strong advocates making the difference if that will prove to be the case.

CHARM-EU Program

Main Steps of Portfolio Assessment Implementation

As CHARM-EU is a highly experimental or innovative higher education program, the first steps taken to the development of its portfolio assessment system

involved ample research into best practices for holistic development that were "underpinned with scientific research…fit for purpose" (CHARM-EU Assessment Handbook, 2021, p. 3). Following this research, ten educational principles and seven assessment principles were developed to guide the program's future development in ways such as the formation of a Portfolio Assessment Committee (PAC).

This master's program is based on ten educational principles that, together with separate assessment principles, form the foundations of the curriculum and reflect its philosophy, mission, and values. The ten educational principles are, "1) challenge driven learning, 2) transdisciplinarity, 3) research-led and research-based, 4) sustainability, 5) student-centred, 6) inclusivity in education, 7) transversal skills, 8) transnational and intercultural learning, 9) technology enhanced, and 10) authentic and situated learning" (*CHARM-EU Pedagogical Guidelines: Theoretical Background to the CHARM-EU Educational Principles, 2020*, p. 8-9). Assessment in this Master's program is likewise based on key principles and that aims to take a decidedly holistic approach that focuses on each individual student's development over a significant time period rather than simply relying on summative assessment scores that are then weighted and averaged to provide a grade. To this end, CHARM-EU designed seven assessment principles to guide the program. These principles are, "1) outcome-based, 2) student-centred, 3) feedback focused, 4) mentor supported, 5) multiple assessors and methods applied, 6) process-oriented, and 7) flexible" (C*HARM-EU Assessment Handbook*, 2021, p. 7).

The principles listed above were then reflected in the implementation of the assessment procedures used by CHARM-EU in its master's program that consists of three phases worth 30 credits (ECTS) each. The first two of these phases contains three modules worth 10 ECTS each and the third phase is a capstone phase containing a single module worth 30 ECTS (*CHARM-EU Master's Module Structure*, n.d.). Each phase has a separate focus, though all aim to accomplish seven Program Learning Outcomes (PLOs) over the course of all of the modules. As one interviewee phrased it, the formation of PLOs is essential and must happen as a first step in order for the proper assessment of portfolios to occur:

> I guess when you are trying to implement programmatic assessment the first step is to see what the learning outcomes are. And this is very important because the PLOs that you are absolutely going to evaluate will be in line with your learning outcomes so you have to first specifically determine learning outcomes and then see what are the scales or what are these portfolio parts or characteristics that should be evaluated and how many should that be. (Interview, I4)

These PLOs guide the development of the module assessments in each phase. Module assessments are not focused around providing traditional scores to students but rather their submission and the feedback given by module assessors are included in the student's digital portfolio and therefore visible for the student to see at any time. Throughout these modules, students receive regular feedback from module assessors in addition to support and guidance from regular meetings with the mentors they are matched with at the start of the entire program. Finally, at the end of each phase, each student's digital portfolio that includes records and feedback on the assessments from the modules of that phase is taken into consideration by the separate PAC. This committee then reaches a consensus on how the student's portfolio should be scored before making a pass/fail decision on the student based upon their portfolio (*CHARM-EU Assessment Handbook*, 2021).

For continuing evaluation of the portfolio assessment system, the approach seems to be the perspective that there is always room for improvement and that each year brings new understanding and opportunities for further adaptation and innovation. An ongoing example of this is in how percentage scores are applied to portfolios following their assessment by the PAC. Initially, this system was evaluated as being too broad and not able to provide clear enough feedback to students when it used judgments ranging from 0-50% below expectations, 50-80% at expectations, and 80-100% above expectations. These ranges were then subdivided into "minus" "normal" and "plus" ranges to better reflect where students were at within each larger category, e.g. at expectations minus was 50-60%, at expectations normal was 60-70%, and above expectations plus was 70-80%. With this development, assessors felt most comfortable giving scores in multiples of 10, e.g. 60 or 70. Still, this was deemed too broad and so the following year assessors were encouraged to score portfolios with percentages in multiples of 5, instead. This was initially seen as challenging but ultimately it was worked out and been viewed as an improvement of the system based on program stakeholders evaluating previous models to be overly broad (Interview, I5).

This approach of always believing in room for improvement is reflected well in the following quote by another interviewee that discusses CHARM's enthusiastic embrace of innovation and openness to change based on feedback and evaluation:

> We are at the step of seeing some new discussions and changes so it is very early to say how it is going to progress because we are still giving feedback…Certainly we have come up, this is a brand new thing we have started to put together, it doesn't exist, we are just a virtually put together university and not a legally established university so we are putting together something totally new and in this respect we knew there would be difficulties and didn't know what we would come up with so we are open too what kind of agreements we will makes so everyone is quite flexible there was no idea of we will only do this or that. (Interview, I4)

Hoped-for Benefits of Implementation

The following table provides an overview of hoped-for benefits mentioned in data from the interviews and documents. These benefits are numerous and so each is mentioned in brief. Overall, the strength of belief in innovation tends to guide the hopes of this program for a holistic program of portfolio assessment.

Hoped-for Benefits of System (CHARM-EU)	Source	Relevant Sample Quotation
Give a holistic view of student progress, allow for greater flexibility of assessment	I4, I5, D7, D8	"We decided on holistic approach, if they have good enough level to pass, we adapt the level of PLO that is weaker to the lower limit to accomplish the rules and regulations"
Give more detailed, formative feedback to ensure student progress	I4, I5, D6, D8	"Students, stakeholders, teachers are involved during the semester and giving feedback on each student but the role of the teacher is not that of giving the final grade it's just giving input to the student with the peers and the stakeholders"
Allow complex, authentic assessment such as PBL	I4, I5, D6, D9	"I think that a lot of traditional universities are just teaching facts and assessing them but I believe in PBL at every level because we have a problem based world."
Document thoroughly student learning	I4, I5	"It is very good if they are progressing in a positive manner but not good if they are

and progress		progressing in a negative manner. You have to access the files that have been submitted."
Provide transdisciplinary perspective	I4, I5, D6, D9	"take into account sustainability, all the stakeholders involved, all the opportunities that transcdsiciplinarity can create."
Create greater reliability of assessment through multiple assessors	I4, I5, D8	"So you fill it out and submit it without knowing what the others have submitted for feedback. Together this is put into a big spreadsheet so you can see grouped together, those that have evaluations from two evaluators that are the same it will be easy to discuss because then we discuss are we satisfied with the results how close are the two evaluations then we determine the final mark"
Provide student-centered opportunities for development	I4, D7, D8, D9	"the student creates his or her own persona, role, and advances according to how he or she develops herself to be able to advance and provide positive feedback. Total difference between teaching something and assessing what has been learned, provided huge spectrum of roles and tasks that the student picks for himself or herself that the student is able to progress and give added value to."
Provide greater insight into student strengths, weaknesses, personality	I4, I5, D8	"the behavior of each student always appears in some place or some comments of their peers or teachers or own self reflection but look at all of this you finally get an idea about the student…maybe this student doesn't work well with others or provide good ideas or is very smart at providing solutions, just works."
Develop transversal skills	D6	"Teachers will have the opportunity to try innovative methods and learning tools in order to optimise their time and help their students develop transversal skills and where reasonable, offer further access to supportive materials and educational sources."
Assist in student career development	I4	"guide the student to whatever aims and how to grow his personal portfolio and professional development"
Create transparency in the assessment process	D8, D9	"It creates transparency to the student and the assessors (teachers, peers and so on)…make sure that the rubric is in the e-portfolio beforehand for the student to consult. Also, emphasize the use and aim of the rubric in for example the student handbook or during an introductory lecture."
Encourage student reflection	D8	"To achieve deep reflection these resources will provide input for student-mentor meetings. Next to the reflective activities within the Modules students write reflection pieces regularly in preparation for a mentor assessment where they reflect on the feedback from all Module assessments in that Phase and define longer term learning goals."

Figure 7: Hoped-for benefits for CHARM-EU Portfolio Assessment

Preparation and Support for Teachers with Portfolio Assessment

It should first be mentioned that many of the documents used for analysis in this study are, in fact, resources that have been created with at least the partial purpose

of providing support to teachers that participate in the CHARM-EU program, e.g. the *CHARM-EU Assessment Handbook* (D11) and *CHARM-EU Pedagogical Guidelines: Theoretical Background to the CHARM-EU Educational Principles* (D9) both mention being intended for stakeholders in the program generally and for teachers or teaching & learning professionals, specifically. These documents and others available on the official website of the program provide easily accessibly support resources to teachers by addressing core principles underlying the design and intent of the program while also handling common questions that may arise among academic professionals that participate in CHARM-EU in one form or another.

Aside from documents being available, CHARM-EU offers explicit support to its assessors in the form of workshops. These workshops seem to have a clear purpose of increasing the reliability of portfolio assessment in the program by ensuring that all assessors are performing the procedure with similar understanding and awarding similar evaluations on the materials that are submitted. One interviewee described the processes of these workshops in detail:

> The training sessions have two parts, roughly, maybe the first is the programmatic assessment…teaches us a bit about programmatic assessment, holistic assessment, etc and later we go to practical implementation. We have several sessions where we look at structure, we choose a couple of students, we read together the portfolio, we discuss about the feeling of the examiner how to assess, what is the scheme, how to implement, personal feeling about knowing how or not, then we read together a couple of portfolios then we try to extract info about what they know about sustainability and transdisciplinarity then we do a couple sessions where common portfolios are assessed…. then we have some steps then we propose to different examiners to assess a set of 3, 4 ,5 students then we do a session everybody submit their assessment then we compare why we got there, then it's a collaboration process to see the marks of everybody (Interview, I5)

This process of continuing collaboration exercises using sample portfolios until assessors are evaluating similarly enough to be within a 5-10 point difference is also mentioned by I4 as a key component of assessor preparation (Interview, I4). I5 noted that this is a effective preparation method since, despite the challenges and time required for it, by the end of these workshops most participating assessors are surprised and impressed with how closely different assessors end up marking the same portfolios (Interview, I5). This practice therefore seems to be a valued method for increasing teacher comfort and confidence in their assessment procedures while also increasing the overall reliability of the process.

Beyond this, the nature of CHARM-EU as a university alliance results in a lack of uniform institutional support for teachers that may be struggling with the extra responsibilities and workload commensurate with participation in the program. Essentially, support for participating teachers is left to the discretion and resource availability of their home institutions and so this support can only be offered in an uneven, non-standardized way. I5 explained their experience with this problem:

> How to support people with struggle on this? Depends on each university… Not any standard support that when you are involved with this like you are going to reduce your courses in this part or change your salary in this part there is nothing clear on this. Most people that are involved now is because we are interested and then we get some kind of reward maybe reduced courses but in some cases you don't and you don't know what you are working. At least at [interviewee's institution] I had course reduction but as I have so many other

> activities involved in practical terms my workload cannot change so it is just increased by CHARM… at each university, this is solved in a different way, there is no legal security, you don't know what you will get with this. (Interview, I5)

This uncertainty or lack of guaranteed security is undoubtedly problematic for educational professionals that are interested in participating in the program. Unlike the workshops and support resources made available to teachers, this situation seems to be out of the control of CHARM-EU to remedy due to its variability across institutions that are themselves across multiple different countries and cultures.

Future Trends and Directions

As CHARM-EU and its program are still quite new, the interviewee perspective on it seems to be that it is constantly in a transition state and so the future of the program is difficult to predict in how it will progress. I4 and I5 had different responses when asked about their estimation of the program's future direction, with I4 remaining hopeful that like-minded people will continue the progression of programs like CHARM-EU while I5 was more skeptical about the sustainability of the program's current model due to the intensive resource requirements involved from its participants.

I4 expressed their feeling about the attractiveness of the program to potential future participants in the following quotation:

> Open minded universities will come up with something new that we commonly agree on. It is not just that I think that common people in those universities that came together but those people that are looking forward to challenges, that are open and flexible to these things, are attracted to these programs that are challenging. (Interview, I4)

Since the current status of the program is that it mostly involves staff that are involved based upon enthusiasm, this response seems to demonstrate a belief that the CHARM-EU program model will still continue in the same way that it currently exists. As to potential problems that are within the power of the alliance to ameliorate, I4 also explained that they believed their feedback, even in the form of doubts, could result in improvements in the future of the program. They mentioned that these improvements were still difficult to predict since the decisions on given feedback will be ultimately be made by a committee (Interview, I4).

I5, by contrast, mentions what they see as current problems with the program that they believe will continue to be problematic or worsen over time. The problem with the perceived unsustainability with regard to resources and workload seems to be a chief concern:

> My vision of the future is there will not be enough resources to implement good enough this approach because you need a lot of resources, much more than we are using now. How will this evolve? I think as happens in CHARM, some fewer students will get access to this and the others cannot because of the financial requirements are very important...and I think this is the problem facing the CHARM. So the amount of money for the future is for sure not enough…So some of the main problems on this on one side we all agreed that this workload is not sustainable for the future… (Interview, I5)

I5 also stressed that their given opinions are from a practical standpoint rather than an ideological one. They expressed belief in and support of the model of portfolio assessment used by CHARM-EU, they simply were not optimistic that it can continue in its current fashion due to the practical demands it requires. They were further skeptical or pessimistic that the portfolio assessment model used by the program would

indeed be embraced by or serve as a model for other higher education programs because, as an innovative model, they did not see society in general having the patience to understand it. They expressed that the ingrained desire to have easily quantifiable percentages and numbers easily arrived at for assessment has made people "prisoners of scores" that have difficulty accepting any other model (Interview, I5).

Dublin City University (DCU)

Main Steps of Portfolio Assessment Implementation

DCU has taken both a meso-level and micro-level approach to portfolio assessment in the way that the portfolio system itself spans across the entire institution while using this system as a tool for assessment is generally optional and so its implementation procedure is left to each individual teacher's discretion. The process of how the portfolio system at DCU was initiated and developed has already been covered in the previous context section of this study and so individual, micro-level implementations will be the focus of this section aside from a brief mention of further insight into the original impetus and actions for the development of the entire portfolio system at DCU that was gained from interviews.

The first step of the introduction of a portfolio system at DCU was its inclusion in a 2012-2017 five-year strategic plan. The major reason for this inclusion was that the principal at the time was a strong advocate for digital portfolios because they believed that such portfolios could, as a vehicle, help to "capture graduate attributes" and so the interviewee noted that, "having that kind of management buy-in did add a lot of credence and support to eportfolios" (Interview, I8). The interviewee went on to acknowledge what a challenging task implementation of a portfolio system would have been otherwise, concluding that any continuing future development has to "come from the top" and that ultimately "the book stops" with whomever that may be (Interview, I8).

Another key factor that was mentioned in the initial implementation was that DCU made the initial decision of appointing a dedicated lead developer whose role was bounded entirely within the responsibilities of managing the implementation of the digital portfolio system. The interviewee, who has experience at other universities that have also implemented or attempted to implement portfolio systems, believes that this decision of creating a dedicated administrator was the critical element in the successful implementation at the full scale of the university (Interview, I8). With these insights taken together, the importance of initial senior level support and sufficient dedication of human resources to the task of implementation seem to be vital steps to a meso-level approach.

According to instructor testimonials, the help of administrative support, along with procedures to familiarize students with the system in a way that is likely to engage them, appear to also be crucial first steps towards micro-level implementation. A psychology teacher at DCU discussed their experience with introducing portfolio assessment to their module:

> In consultation with DCU's Teaching Enhancement Unit team, this assessment was built using best practice approaches and rubrics with the Loop Reflect eportfolio platform. The 3- part structure to this assignment was designed to allow students to produce their own piece of critically reflective writing in addition to an interaction with an external organisation via a medium of their choosing. To reflect the growing preferences for podcasts, videos, and social media formats for content, the eportfolio therefore allowed for sufficient scope in curating and hosting alternative mediums. (Donaldson, 2021, p. 30)

Another instructor from DCU in the field of aviation management offered a similar testimonial regarding their successful implementation of portfolio assessment:

> Supports were offered to the students in the form of an eportfolio introduction workshop by a colleague from the Teaching Enhancement Unit. In the workshop, students were introduced to the eportfolio concept and received instruction on how to go about preparing and populating it with material, as well as where they could find Help videos and other materials to resolve any technical issues they might encounter. At their request, students were given an anonymised version of a previous year's student's eportfolio to guide their work. (Donaldson, 2021, p. 27)

Testimonials from other DCU teachers likewise stress the importance of student preparation and support to the success of portfolio assessment in their modules. This support was often provided by administrative staff either directly, in the form of workshops or trouble-shooting classes, or indirectly, in the form of teachers adopting resources such as rubrics and videos created by administrators for use in varied disciplinary contexts at DCU (Donaldson, 2021).

Evaluation of the portfolio assessment at DCU seems to be based on student feedback and whether the teacher utilizing it feels they have achieved the learning outcomes and results they planned for when designing the assessment. Teachers that make use of portfolio assessment tend to reflect on its success themselves and evaluate it accordingly, with the hope being that the process can be continually improved based on lessons learned from each iteration of implementation. One interviewee discussed this process of reflection on using portfolio assessment in a module that they teach:

> I provide them with a portfolio template with different sections for them to fill in. I think in a lot of cases, I've been reflecting on it recently, they give me something that looks like the plain old template. A lot of students send it back just like that, few add color and personalization where it just looks like the bits that have been filled in. I wonder if the template is supporting them, but is it also constraining them where they think they only need to fill in these bits and then that's their portfolio? I would love for them to run with it and put their own thoughts and personality into it. Some of them think of it as just filling in boxes and so it's not reaching full potential. (Interview, I7)

Another interviewee discussed how administrators collected formal and informal feedback to see what parts of the process could be improved. They noted that the results tended to be rather extreme one way or the other with little neutral ground. The students that hated it tended to complain about the difficulty it took to learn or use the system rather than about portfolio assessment as a concept (Interview, I8). These kinds of student perceptions stimulate further development of the portfolio assessment system in each respective module where it continues to be utilized.

Hoped-for Benefits of Implementation

The following table provides an overview of hoped-for benefits mentioned in data from the interviews and documents. These benefits are numerous and so they are mentioned in brief. DCU has a notable wealth of literature on the topic that includes accumulated teacher testimonials on their usage of portfolio assessment in their modules and so the benefits listed here are more plentiful than in the other two observed cases.

Hoped-for Benefits of System (DCU)	Source	Relevant Sample Quotation
Encourage student reflection	I6, I7,	"The decision to use the Mahara eportfolio

	D11, D13	platform was predicated on the desire to support deeper skills of reflection and curation whereby all students were using the same platform and supporting each other. It also gave the institution better control of the final assessment."
Enable more opportunities for peer feedback and support among students	D11, D13	Same as above
Greater institutional control over course assessments	D11	Same as above
Provide student-centered opportunities for development	I6, I7, D11	"In addition, they were asked to reflect on their practice and the on-going development of skills to support a stronger recognition of their professional identities."
Supporting deeper student learning	D11	"I will be introducing more structured formative assessment to develop learners by encouraging richer content and deeper learning from the reflections."
Document thoroughly student learning and progress	I6, D11, D13	"The development of the ePortfolio helps participants synthesise much of what they have learned, as well as create one cohesive package that demonstrates the skills and knowledge that they bring back to their professional practice and working context."
Assist in student career development	I6, D11, D13	"As our students have access to the eportfolio for life, it is reasonable to assume that is might be a useful resource for former students who wish to develop a portfolio of continuing professional development. The eportfolio is also relevant for relevant for former students when applying for future employment"
Provide more meaningful learning opportunities	D11	"The use of eportfolio for assessment purposes enables faculty to engage students with meaningful individual and collaborative activities."
Support collaborative activities among students	D11	Same as above
Encourage students' creative expression	I6, I7, D13	"Loop Reflect [DCU eportfolio system] enabled students to be more creative and to demonstrate their engagement with the outside world to address societal challenges"
Enable greater inclusivity of assessment, further engage students in their own learning	D13	"In this large-class context, the need to create inclusive methods of assessments that enable students to take ownership of their learning and allow them to express their knowledge dynamically presents itself as significant challenge to lecturers. In attempting to address this challenge, Eportfolio assessment offered a unique and creative way forward in terms of meeting the diverse needs of students."
Allow student expression through a variety of media	I7, D13	"A special attraction is that every single e-portfolio is different to the others (which is certainly not true of a word-document essay) and gives students great leeway to find images, symbols, graphs, tables, photos and so on to support their argument."
Encourage the development of digital skills	I6, D13	"I had attended a University training session on eportfolios and decided it was something I

		would apply because it supported new digital skills for students, and would allow them to produce more differentiated results"
Support the development of transversal skills	I8, D13	"As part of a redesign to enhance innovation in keeping with DCU Futures and to embed transversal skills into our content, this module was updated to become Critical Thinking, Enterprise, and Collaboration Skills. Within this the eportfolio offered an important degree of flexibility."
Ensure compliance with national standards	D13	"Céim: Standards for Initial Teacher Education (Teaching Council, 2020) requires all higher education institutions to embed portfolio-based learning within initial teacher education (ITE) programmes. "
Support greater teacher engagement and connection with students in a way that is enjoyable for teachers	I7, I8, D13	"As an evaluator on this module, I enjoy the insight into the student's personal lives that this assessment type offers me. Speaking about challenges or triumphs can be difficult in a classroom setting but the portfolio allows this to take place in a safe manner. The variety that this assessment type offers is enriching for both lecturer and learner alike."
Motivate students	D13	"The showcasing of competencies that an e-portfolio offers is motivational for learners."
Encourage creation of a study tool for greater student achievement on exams	I8	"What was really impressive after was that the students were then able to use it as a study tool on the exam. The results of that assessment increased almost exponentially, failure went from 16% to 3% after portoflio assessment implementation."
Support academic integrity among students	I6, I7, I8	"I suppose one thing is that it assessed learning in a more authentic way and it improves reflective skills for students, tracks growth over time, connections between different concepts, students would use it to apply to jobs after they finish, it allows for creativity and identity, it definitely improves their digital skills, and it supports academic integrity because it can now be tracked with a text matching tool so students can see kind of where they are going wrong."
Allow for more authentic assessment	I6, I7	Same as above
Support transdisciplinary perspective	I6	Same as above

Figure 8: Hoped-for benefits for DCU Portfolio Assessment

Preparation and Support for Teachers with Portfolio Assessment

As previously mentioned, having dedicated administrative staff whose responsibilities are bounded within the implementation and support of portfolio assessment seems to make a significant impact, with many teachers noting gratitude for support provided by this staff in the form of workshops or created resources to aid their understanding of portfolio assessment theory, benefits, and procedures. Several teacher testimonials in the supporting resources created for evangelization purposes of portfolio assessment mention teachers who either made use of training workshops and seminars held by administrative support staff to become familiarized with it. Others mention being inspired by these events to implement such a system in their own

modules once they have been made aware of the potential benefits offered by portfolios (Donaldson, 2018; Donaldson 2021).

As the portfolio system at DCU is a digital portfolio system that emphasizes multimedia approaches, some of the most frequent requests for support from teachers were in connection to technical issues or concerns. I8 mentions that technical considerations had created some hesitation among teachers and so this hesitation was the reason for the creation of support resources such as the ebooks that have been analyzed as part of this study:

> That was a big part of my role because we needed to anchor it, the technology in useful relevant productive assessment and I suppose there was a lot of uncertainty about and reticence about how to use the eportfolio and that was the impetus behind creating that ebook to create examples of how to assess with eportfolios. (Interview, I8).

Resources like ebooks and general rubrics further help teachers that have concerns about the time required for learning a new system or new assessment methods (Interview, I8).

Support resources aside, hands-on support for technical problems is also essential so that potential adopters and advocates of the system do not give up on it out of frustration with these issues. This is sometimes solvable by support staff at DCU, but at other times the issues are beyond capabilities for immediate solutions. I6 explained the effects that this can have on teacher engagement with the system:

> It was up and running in December and then all of the sudden it stopped working. They [software company support] came up with a number of potential issues for why and those have knock on effects. So when it's going well it's going great but when it's not, it's not... A lot of them gave up on it because it wasn't working, they were excited when it was supposed to be up and running again but then it crashed and so people were walking away from it deciding to give up on it. Previously they may have hit a wall where they have been burnt on maybe tech requests that went unanswered and so they just give up on it or don't want to wait 3 or 4 days. (Interview, I6)

I6 went on to explain how they have made strong efforts to let teachers struggling with the system know that they can come to administrative staff for immediate support rather than having to wait for formal procedures to process the tech support requests but that some teachers still decide to give up on the digital portfolio system out of frustration. It seems that when multimedia opportunities are emphasized as part of a portfolio system then technical support for that system is of paramount importance for successful implementation and ongoing development.

Another aspect of teacher support that seems essential for the meso-level implementation that DCU achieved is preparing teachers to fully utilize the new opportunities afforded by the portfolio system by learning new assessment strategies and redesigning their current assessments. I7 believed that training in this area is necessary so that teachers that implement portfolio assessment do not simply transfer their existing assessments to a new medium:

> I think the challenge is getting lecturers to start portfolio assessment first and then supporting them to design it well because of course a lot of lecturers start it by just saying, 'write me 1000 words on x and then put it into your portfolio' and students say, 'why portfolio then? Can't I just submit it?' (Interview, I7)

This response makes it clear that, when implementing a new system, teachers need support not just for how to use it but for how to actually take advantage of the new opportunities that it affords.

The previous response quoted above also touched on another essential area of teacher support required for successful implementation, that area being simply achieving "buy-in" from teachers and agreement from them that they will engage with and attempt new assessment strategies as part of portfolio assessment. The importance of this aspect is clearly recognized by administrative support staff: "if teachers don't buy into it then students don't buy into it. I'm making them realize that they can come to me for support…Lecturers have to be advocates for portfolios, for students to realize the benefits of it" (Interview, I6). This sentiment was also echoed by I7 when they expressed the need to, "go out and sell the system to lecturers. It's teaching, assessment, etc. full stop. You have to go out there and win the hearts and minds, to go out there and motivate and win them over and teach them" (Interview, I7).

For full-scale meso-level implementation as well as individual micro-level implementation, it seems that dedicated administrative staff to handle concerns with the new system is of paramount importance. This administrative staff is then able to perform the duties of creating resources to familiarize teachers and lessen the potential time burdens placed on them to learn a new system, to handle technical issues, to teach the most effective ways to utilize the new system, and to win over teachers in the first place so that they even have the possibility of successfully implementing portfolio assessment.

Future Trends and Directions

Though the system currently in place at DCU is indeed robust, its future is somewhat uncertain and dependent on continuing support "from the top" if it will progress and develop further. I6 addressed this when they acknowledged that usage of the portfolio system has decreased over time after its initial momentum that I8 mentioned came from support from the president of DCU at the time (Interviews, I6, I8). I7 echoed how important higher-level support is for the continuing development of the program at the meso-level and that, without it, it is difficult to predict the future of the system:

> At a lot of institutions the locus of power shifts and is different in different contexts where some it's module coordinators, others department chair, and other cases the dean of the faculty might be particularly strong. Hard to say with certainty. At an institution level hard to say who or what. There will be competing factors. DCU going through a bit of change, lot of higher education going through a bit of change. (Interview, I7)

I7 went on to explain that, while many teachers do still use portfolio assessment at DCU, it is "by no means a dominant form of assessment in the university" but that they believed the main obstacle to this is teacher conceptions of assessment or resistance to new forms of it.

Technical problems also seem to represent a continuing challenge for more widespread growth of the portfolio assessment system. I6 hoped that the previously listed difficulties, especially with technical and familiarization considerations, could be taken care of enough and explained their perspective as:

> I'm hoping and hopeful that it is going to increase again and we can swing people back into realizing the real benefits of it and trying to bypass the technical issues or ignorance on how to use it. I'm aware of the tech issues but a lot of the things people come to me with as technical issues are not technical issues at all, so they need to spend a couple minutes figuring it out. It is a bit frustrating but it is comforting that the answer is right there. (Interview, I6)

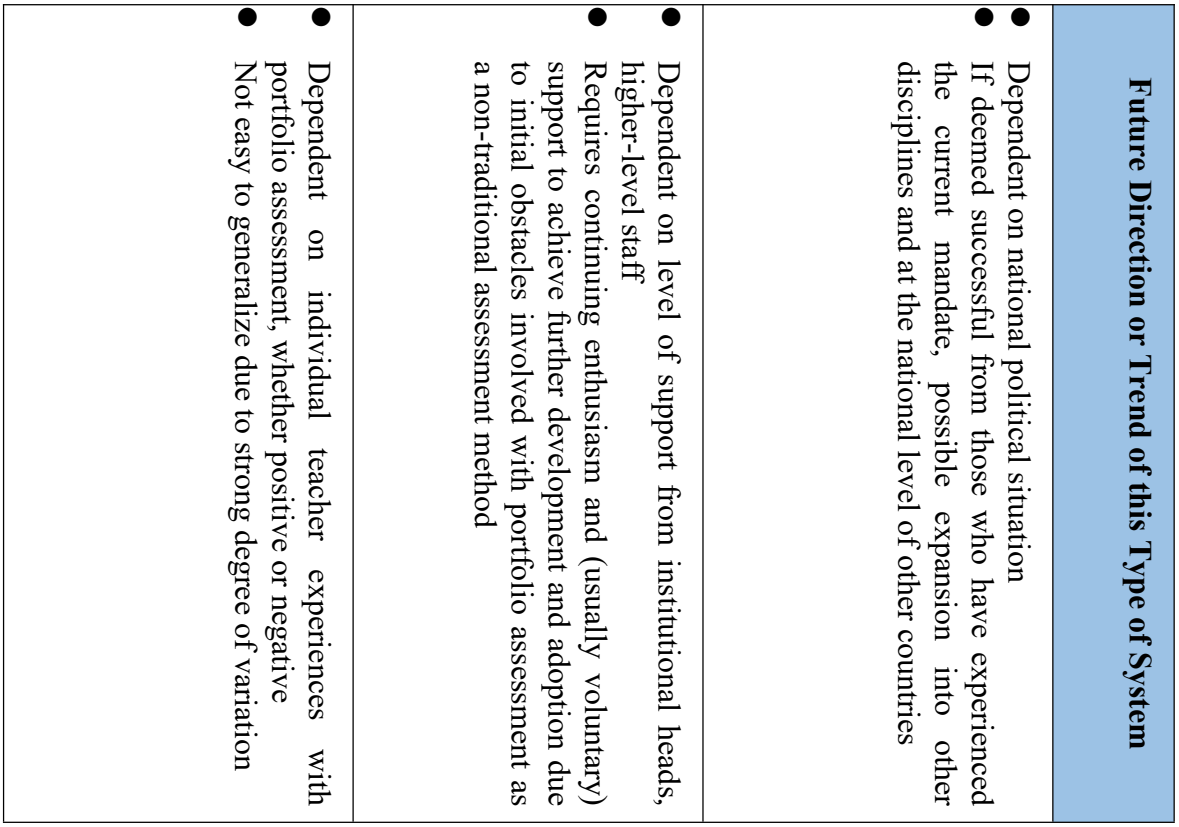
As covered above, these technical issues are often surmountable with dedicated administrative staff to help but that there will always be some issues related to technical problems remaining. This also demonstrates the problem of needing greater teacher engagement at the level where teachers attempt to use existing support resources and put in the effort to learn the system themselves before simply giving up on it as being too unwieldy.

Summary of Findings, Recommendations

The following table is a collection of generalized findings and recommendations for portfolio assessment implementation at either the micro-level, meso-level, or macro-level as according to the analysis of cases performed in this study. These categories and their associated recommendations are not mutually exclusive but instead aim to serve as general insight into the process of portfolio assessment introduction and development in higher education programs.

Type of Program	Recommended Steps for Implementation and Evaluation of System
Macro-level Programs	● National Mandate ● Reaching stakeholder agreement on interpretation of system, goals, outcomes ● Resolution of formal issues, e.g. who will assess, system for receiving submissions ● Evaluate system based on its effectiveness in preparing teachers for future careers (in the case of teacher education programs)
Meso-level Programs	● Research best practices and theory and then establish learning outcomes, create principles of education and assessment ● Use principles and learning outcomes to design modules ● Appoint dedicated administrative staff to support the implementation and development of portfolio assessment system ● Seek higher-level support for portfolio assessment at the university ● Remain open to feedback from teachers, address specific concerns with willingness to further innovate or develop the system
Micro-level Programs	● Famliarize students of the module or program with portfolio assessment by establishing clear expectations, outcomes, and advantages of the sytem over traditional methods ● Consult administrative staff (if possible) for how to best adapt portfolio assessment to specific modules, programs ● Evaluate based on student feedback, achievement of planned learning outcomes for portfolio assessment ● Make use of existing exemplars, documents, and models to ease the time and effort required for adoption

Brief Overview of Hope-for Benefits of the System	Teacher Preparation and Support Necessary for Implementation
● Encourage reflection ● Prepare students to perform research and to integrate and apply knowledge gained this way ● Track student progress and demonstrated skills in preparation for future studies and career ● Ensure compliance with national standards ● Develop student transversal skills ● Allow for more authentic assessment	● Consult actual teachers and other educational experts before the implementation of the system and establishing its standards ● Make roles clear for who will become portfolio assessors and what standards they should use ● Prescribe and support specific preparation from the national government rather than depending on individual programs, institutions, and individuals to take on the increased, often unrecognized burden of support
● Encourage student reflection ● Provide a holistic view of student progress, document skills and progress, possibly for career development ● Support transdisciplinarity between modules ● Provide student-centered opportunities for development ● Develop student transversal skills ● Allow for more authentic assessment ● Support academic integrity among students	● Hold workshops or other support activities to ensure uniformity and reliability of portfolio assessment, and to increase assessor confidence in assessment procedures ● Create resources in the form of documents, videos, rubrics, etc. for teachers to use to become familiar with the system and new methods of assessment, lessen time required for learning system ● Achieve initial “buy-in” from teachers by convincing them of the benefits and capabilities through advocacy, examples ● Provide strong technical support in the case of digital portfolios
● Encourage student reflection ● Support greater teacher engagement and connection with students in an enjoyable manner ● Develop student transversal skills ● Support collaborative activities and peer support, feedback among students ● Encourage student creativity, stimulate their engagement ● Provide student-centered opportunities for development ● Allow for more authentic assessment	● Hold individual consultations with teachers in addition to wider workshops, clinics to address their specific concerns ● Assist teachers to redesign their existing assessments, practices to take full advantage of the opportunities offered by portfolio assessment ● Appoint dedicated support staff to help individual teachers



Future Direction or Trend of this Type of System
• Dependent on national political situation • If deemed successful from those who have experienced the current mandate, possible expansion into other disciplines and at the national level of other countries
• Dependent on level of support from institutional heads, higher-level staff • Requires continuing enthusiasm and (usually voluntary) support to achieve further development and adoption due to initial obstacles involved with portfolio assessment as a non-traditional assessment method
• Dependent on individual teacher experiences with portfolio assessment, whether positive or negative • Not easy to generalize due to strong degree of variation

Figure 9: Table of generalized research results

Conclusion

Much like portfolios themselves, the results from analysis of portfolios and their assessment is quite varied and diverse. While commonalities exist, such as hoped-for benefits including the encouragement of reflection, development of transversal skills, and documenting student progress and skills, ultimately any system of portfolio assessment that is created will require sufficient efforts towards adaptation in order to make it fit its unique context and achieve its desired outcomes. Although comparison between different levels of portfolio assessment introduction, implementation, and development using case studies is fruitful for discovering trends, shared features, and contrasting goals or requirements, one could easily choose a different metric for observation and comparison such as the size, budget, or specific disciplines of different programs for comparison in a study across different cases of portfolio assessment. Perhaps future studies could base their research on one of these areas in order to add further understanding of the phenomenon of portfolio assessment in higher education.

Reference List

Akleh, A. Z., & Wahab, R. A. (2020). Effectiveness of Course Portfolio in Improving Course Quality at Higher Education. *International Journal of Higher Education*. https://doi.org/10.5430/ijhe.v9n3p39

Allen, L. J. S. (2004). Implementing a Culture Portfolio Project within a Constructivist Paradigm. *Foreign Language Annals*, *37*(2), 232–239. https://doi.org/10.1111/j.1944-9720.2004.tb02196.x

Arter, J. A., & Spandel, V. (1992). Using Portfolios of Student Work in Instruction and Assessment. *Educational Measurement: Issues and Practice*, *11*(1), 36–44. https://doi.org/10.1111/j.1745-3992.1992.tb00230.x

Baume, D. (2001) A briefing on assessment of portfolios, in: *LTSN Generic Centre Assessment Series No. 6* (York, LTSN)

Bhattacharya, M. K., & Hartnett, M. (2007). E-portfolio assessment in higher education. *Proceedings - Frontiers in Education Conference*. https://doi.org/10.1109/fie.2007.4418182

Bolliger, D., & Shepherd, C. (2010). Student perceptions of ePortfolio integration in online courses. *Distance Education*, *31*(3), 295–314. https://doi.org/10.1080/01587919.2010.513955

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/qrj0902027

Brief History of ELTE. (n.d.). www.elte.hu. https://www.elte.hu/en/history

Brown, J. B. (2001). The Portfolio: A Reflective Bridge Connecting the Learner, Higher Education, and the Workplace. *The Journal of Continuing Higher Education*, *49*(2), 2–13. https://doi.org/10.1080/07377366.2001.10400426

Ciesielkiewicz, M., Wisser, W., & Rozells, D. J. (2019). International Perspectives on ePortfolios in Higher Education: Case Studies from Asia, North America and Europe. *International Journal of Emerging Technologies in Learning (Ijet)*, *14*(21), 96. https://doi.org/10.3991/ijet.v14i21.11048

CHARM-EU | Who we are. (n.d.). https://www.charm-eu.eu/who-we-are

CHARM-EU Master's Module Structure. (n.d.). CHARM-EU. https://www.charm-eu.eu/sites/default/files/2022-11/MSc%20module%20structure.pdf

CHARM-EU Pedagogical Guidelines: Theoretical Background to the CHARM-EU Educational Principles. (2020). https://www.charm-eu.eu/sites/default/files/2023-03/D4.1%20Pedagogical%20Guidelines.pdf

CHARM-EU Assessment Handbook. (2021). CHARM-EU. https://www.charm-eu.eu/sites/default/files/2023-03/D4.6%20Assessment%20Techniques%20and%20Criteria%20Resources.pdf

CHARM-EU Mission and Vision Statement. (2022). CHARM-EU. https://www.charm-eu.eu/sites/default/files/2023-01/CHARM-EU%20Mission%20vision%20_2022.pdf

CHARM-EU Programme Content Guidelines. (2022). CHARM-EU. https://www.charm-eu.eu/sites/default/files/2023-03/D3.2%20Programme%20Content%20Guidelines.pdf

Child, S., & Shaw, S. D. (2019). Towards an operational framework for establishing and assessing collaborative interactions. *Research Papers in Education*, *34*(3), 276–297. https://doi.org/10.1080/02671522.2018.1424928

Chrappán, M., Kopp, E., & Pesti, C. (2020). Initial Teacher Education in Hungary: Issues, Policies, Practices. *Eastern European Journal of Transnational Relations*, 4(1), 49–74. https://doi.org/10.15290/eejtr.2020.04.01.03

Chye, S. Y. L. (2021). Towards a Framework for Integrating Digital Portfolios into Teacher Education. *TechTrends*, 65(5), 818–830. https://doi.org/10.1007/s11528-021-00646-0

Cooper, T, & Love, T. (2007). e-Portfolios in e-learning. In N.A. Buzzetto-More (Ed.), Advanced principles of effective e-learning (pp.264-290). Santa Rosa, CA: Informing Science Press.

Davis, M. H., & Ponnamperuma, G. G. (2005). Portfolio assessment. Journal of Veterinary Medical Education,32(3), 279−284. https://doi.org/10.3138/jvme.32.3.279

Davis, M. H., & Ponnamperuma, G. G. (2010). Examiner perceptions of a portfolio assessment process. Medical Teacher, 32(5), e211–e215. https://doi.org/10.3109/01421591003690312

Donaldson, L. (2018) (Ed), Eportfolio Based Assessment - Inspiring Exploration and Supporting Evaluation for Practitioners. [online book]. National Institute for Digital Learning, Dublin City University.

Donaldson, L. (Ed.). (2021). *Exemplars of best practice with Eportfolio based assessment at Dublin City University*. NIDL. Dublin.

Donaldson, L. (Ed.). (2022). Exploring the Diversity of Eportfolio Practice: An international sharing of practice, activities, assessment. NIDL. Dublin.

Dysthe, O., & Engelsen, K. S. (2011). Portfolio practices in higher education in Norway in an international perspective: macro-, meso- and micro-level influences. *Assessment & Evaluation in Higher Education*, *36*(1), 63–79. https://doi.org/10.1080/02602930903197891

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal*, 5(6), 00149.

Hesterman, S. (2016). The Digital Handshake: A Group Contract for Authentic eLearning in Higher Education. *Journal of University Teaching and Learning Practice*, *13*(3), 85–109. https://doi.org/10.53761/1.13.3.6

Jones, E. (2010). A Professional Practice Portfolio for Quality Learning. *Higher Education Quarterly*. https://doi.org/10.1111/j.1468-2273.2010.00458.x

Kelly-Riley, D., Elliot, N., & Rudniy, A. (2016). An Empirical Framework for ePortfolio Assessment. *International Journal of EPortfolio*, *6*(2), 95–116. http://files.eric.ed.gov/fulltext/EJ1120700.pdf

Kopp, E., Kálmán, O. (2023). Teacher Education in Hungary: Between Autonomy and Control. In: Kowalczuk-Walędziak, M., Valeeva, R.A., Sablić, M., Menter, I. (eds) The Palgrave Handbook of Teacher Education in Central and Eastern Europe. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-09515-3_3

Klenowski, V., Askew, S., & Carnell, E. (2006). Portfolios for learning, assessment and professional development in higher education. *Assessment & Evaluation in Higher Education*, *31*(3), 267–286. https://doi.org/10.1080/02602930500352816

Learning with ePortfolios. (n.d.). Dublin City University. https://www.dcu.ie/teu/learning-eportfolios

Lewis, L. (2015). A critical reflection on Eportfolio as a teaching tool. *New Zealand Journal of Teachers' Work*, 12(2), 115–130.

Lorenzo, G., & Ittelson, J. (2005). An Overview of E-Portfolios. *EDUCAUSE Learning Initiative*. https://www.educause.edu/ir/library/pdf/ELI3001.pdf

Love, T., & Cooper, T. (2004). Designing Online Information Systems for Portfolio-Based Assessment: Design Criteria and Heuristics. *Journal of Information Technology Education*, *3*, 065–081. https://doi.org/10.28945/289

Marinho, P., Fernandes, P., & Pimentel, F. (2021). The digital portfolio as an assessment strategy for learning in higher education. Distance Education, 42(2), 253–267. https://doi.org/10.1080/01587919.2021.1911628

Meeus, W., Van Petegem, P., & Van Looy, L. (2006). Portfolio in Higher Education: Time for a Clarificatory Framework. *The International Journal of Teaching and Learning in Higher Education*, *17*(2), 127–135. https://www.isetl.org/ijtlhe/pdf/IJTLHE27.pdf

Moss, P. (1994). Can There Be Validity without Reliability? *Educational Researcher*, *23*(2), 5. https://doi.org/10.2307/1176218

Murray, J. P., ERIC Clearinghouse on Higher Education, & Association for the Study of Higher Education. (1997). *Successful Faculty Development and Evaluation: The Complete Teaching Portfolio*. Wiley.

Ngui, W., Pang, V., & Hiew, W. (2022). E-portfolio as an academic writing assessment tool in higher education: strengths and challenges. *Indonesian Journal of Applied Linguistics*, 12(2), 556-568. https://doi.org/10.17509/ijal.v12i2.40122

Paulson, L. F., & Paulson, P. R. (1990). How Do Portfolios Measure Up? A Cognitive Model for Assessing Portfolios. Revised. *Annual Meeting of the Northwest Evaluation Association.*

Paulson, F. L., Paulson, P. R., & Meyer, C. (1991). What Makes a Portfolio a Portfolio? *Educational Leadership*, 48(5), 60–63.

Paulson, F. L., & Paulson, P. R. (1994). Assessing Portfolios Using the Constructivist Paradigm. *Annual Meeting of the American Educational Research Association*.

Parveen, S. (2020). 360 Degree holistic assessment: A new approach to shape the personality of a learner as visualized by national education policy 2020. *International Journal of Reflective Research in Social Sciences*, *3*(2), 4–8.

Patton, M. Q. (2017). *Qualitative Research & Evaluation Methods*.

Peet, M., Matney, M. M., Gurin, P., Boyer, P., Marra, T., Taylor, S. E., Daley, A., & Lonn, S. (2011). Fostering Integrative Knowledge Through ePortfolios. *International Journal of ePortfolio*, *1*(1), 11–31. http://files.eric.ed.gov/fulltext/EJ1107600.pdf

Popescu-Mitroia, M., Todorescu, L., & Greculescu, A. (2015). The Usefulness of Portfolios as Assessment Tools in Higher Education. *Procedia - Social and Behavioral Sciences*, *191*, 2645–2649. https://doi.org/10.1016/j.sbspro.2015.04.722

Qvortrup, A., & Keiding, T. B. (2015). Portfolio assessment: production and reduction of complexity. *Assessment & Evaluation in Higher Education*, *40*(3), 407–419. https://doi.org/10.1080/02602938.2014.918087

Reese, M. L., & Levy, R. (2009). Assessing the Future: E-Portfolio Trends, Uses, and Options in Higher Education. *EDUCAUSE Journal for Applied Research Research Bulletin*.

Ripley, D. M. (2013). Implementing Portfolio-Based Language Assessment in LINC Programs: Benefits and Challenges. *TESL Canada Journal*, *30*(1), 69. https://doi.org/10.18806/tesl.v30i1.1126

Rhodes, T. L. (2010). Making Learning Visible and Meaningful Through Electronic Portfolios. *Change: The Magazine of Higher Learning*, *43*(1), 6–13. https://doi.org/10.1080/00091383.2011.538636

Ruslin, Mashuri, S., Rasak, M., Alhabsyi, F., & Syam, H. (2022). Semi-structured Interview: A Methodological Reflection on the Development of a Qualitative Research Instrument in Educational Studies. *IOSR Journal of Research & Method in Education (IOSR-JRME)*, *12*(1), 22–29.

Scully, D., O'Leary, M. & Brown, M. (2018). *The Learning Portfolio in Higher Education: A Game of Snakes and Ladders*. Dublin: Dublin City University, Centre for Assessment Research, Policy & Practice in Education (CARPE) and National Institute for Digital Learning (NIDL).

Skrabal, M. Z., Turner, P., Jones, R. M., Tilleman, J. A., & Coover, K. (2012). Portfolio Use and Practices in US Colleges and Schools of Pharmacy. *The American Journal of Pharmaceutical Education*. https://doi.org/10.5688/ajpe76346

Syzdykova, Z., Koblandin, K., Mikhaylova, N. B., & Akinina, O. (2021). Assessment of E-Portfolio in Higher Education. *International Journal of Emerging Technologies in Learning (Ijet)*, *16*(02), 120. https://doi.org/10.3991/ijet.v16i02.18819

Symeonidis, V. (2017). Weaving the Threads of a Continuum: Teacher Education in Hungary from the Perspective of European Developments. *Studia Paedagogica*, *22*(4), 131–149. https://doi.org/10.5817/sp2017-4-7

Symeonidis, V. (2019). Teacher competence frameworks in Hungary: A case study on the continuum of teacher learning. *European Journal of Education*, *54*(3), 400–412. https://doi.org/10.1111/ejed.12347

Syzdykova, Z., Koblandin, K., Mikhaylova, N. B., & Akinina, O. (2021). Assessment of E-Portfolio in Higher Education. *International Journal of Emerging Technologies in Learning (Ijet)*, *16*(02), 120. https://doi.org/10.3991/ijet.v16i02.18819

Tigelaar, D. E., Dolmans, D. H. J. M., Wolfhagen, I. H. a. P., & Van Der Vleuten, C. P. M. (2005). Quality issues in judging portfolios: implications for organizing teaching portfolio assessment procedures. *Studies in Higher Education*, *30*(5), 595–610. https://doi.org/10.1080/03075070500249302

Thurmond, V. A. (2001). The Point of Triangulation. *Journal of Nursing Scholarship*, *33*(3), 253–258. https://doi.org/10.1111/j.1547-5069.2001.00253.x

Tochel, C., Haig, A., Hesketh, A., Cadzow, A., Beggs, K., Colthart, I., & Peacock, H. (2009). The effectiveness of portfolios for post-graduate assessment and education: BEME Guide No 12. Medical Teacher, 31(4), 299–318. https://doi.org/10.1080/01421590902883056

Torre, E. M. (2019). Training University Teachers on the Use of the ePortfolio in Teaching and Assessment. *International Journal of ePortfolio*, 9(2), 97–110.

UNESCO. (n.d.). *Portfolio assessment*. UNESCO International Bureau of Education. https://www.ibe.unesco.org/en/glossary-curriculum-terminology/p/portfolio-assessment

Villano, M. (2006). Electronic Student Assessment: The Power of the Portfolio. *Campus Technology*, *20*(1), 21. https://eric.ed.gov/?id=EJ846910

Valeri-Gold, M., Olson, J. R., & Denning, M. P. (1992). Portfolios: Collaborative Authentic Assessment Opportunities for College Developmental Learners. *The Journal of Reading*, *35*(4), 298–305. https://www.jstor.org/stable/400332298

Walland, E., & Shaw, S. (2022). E-portfolios in teaching, learning and assessment: tensions in theory and praxis. Technology, Pedagogy and Education, 31(3), 363–379. https://doi.org/10.1080/1475939X.2022.2074087

Wang, P., & Jeffrey, R. (2017). Listening to learners: An investigation into college students' attitudes towards the adoption of e-portfolios in English assessment and learning. *British Journal of Educational Technology*, *48*(6), 1451–1463. https://doi.org/10.1111/bjet.12513

Yin, R. K. (2017). *Case Study Research and Applications: Design and Methods*.

Zubizarreta, J., Storms, S. B., Miners, L., Nantz, K., & Torosyan, R. (2009). The learning portfolio: Reflective practice for improving student learning 2nd Ed. *Jossey-Bass EBooks*. http://ctaar.rutgers.edu/events/Zubizarreta-Portfolios.pdf

Appendix 1: Interview Guides

Interview Guide for Academic Professionals (university teachers and directors)

Part 1: Basic Information

1. What is your academic background?
2. What do you currently see as your role and responsibility at your institution?
3. For roughly how long have you been involved with portfolio assessment?

Part 2: Key Structure of System of Portfolio Assessment

1. Could you briefly describe the structure of portfolio assessment in your program?
    a) Could you direct me to any literature explaining this model in detail?
2. What are the main aims and principles of portfolio assessment in your program?
    a) Do you know if this structure was modeled on or influenced by any previous models or literature?
    b) Do you know of any other programs that have been influenced by your program's model?

Part 3: Experience with the Practice of Portfolio Assessment

1. How would you describe your current experience with portfolio assessment? Please describe in detail what your regular tasks are?
2. What do you value/like or dislike in portfolio assessment at your institution/programme? Why?
    a) Have these views changed over time? If so, why do you think that is?
3. Do you feel that your colleagues mostly share your views?
    a) If not, is there any factor to which you would attribute this difference in views?
4. Are you aware of the views on portfolio assessment of students in your program? If so, how would you summarize them?

Part 4: Process of Implementation and Development

1. Are you aware of who was most responsible for the decision to introduce portfolio assessment to your program? Do you know roughly when and how the decision was made?
2. Are you aware of any particular reasons behind the initial decision to implement portfolio assessment?
    a) If not, would you say the general reasons were primarily internal or external?
3. How would you describe the hoped-for benefits of implementing portfolio assessment? Have these benefits changed over time? If so, why do you believe that is?
4. What would you describe as the first step to implementing portfolio assessment to your program?
    a) Are you aware how long the implementation process took to begin after the decision to introduce portfolio assessment was made? Were there any causes for delay?
5. What major steps or milestones would you discern in the development of the portfolio assessment system of your program? How would you describe them?
6. What major risks or challenges have occurred in the process of implementing this system? What have been the plans or steps to address these risks and challenges?

Part 5: Teacher Training and Support

1. How did you learn how to assess students' portfolios? What were the main steps in your development? What were the main challenges in this learning process?
2. Would you describe the process of how teachers in your program are trained for the practice of portfolio assessment? Are there any major steps or milestones?
3. How are teachers chosen for participation in portfolio assessment? Is it a requirement for all teachers in the program?
4. Have there been any common challenges in the training process? How would you describe them?
    a) Do you have any notable examples of individual problems with the process?
5. What support is offered to teachers experiencing challenges with or resistance to portfolio assessment training? Do you feel this support has been effective? Would you suggest any changes?
6. Have there been any challenges involving how teachers evaluate portfolios?
7. Are there any ongoing training or support options available to teachers in your program that may experience challenges? Would you describe them? Is staff satisfied with these options?
    a) Is there mandatory ongoing training or support? If so, how would you describe staff feelings on this?

Part 6: Current Challenges and Future Direction
1. What would you describe as the current major challenges involved with portfolio assessment in your program? What is being done to address these challenges?
2. Would you describe what you see as the future of portfolio assessment in your program? Do you see it as expanding? Shrinking? Continuing as it currently is? Why?
3. Who or what do you believe has the largest impact on the future direction of portfolio assessment in your program? Why?
4. Do you feel that implementing portfolio assessment in your program has produced its expected benefits? Why or why not?
    a) Do you believe there have been any drawbacks? If so, why and are there any factors to which you would attribute these drawbacks?
5. If you could change any past or present decision or step in the implementation process, would you change anything? Why or why not?
6. Do you have any advice or recommendations for other programs looking to implement portfolio assessment? Would you recommend it to other programs at all

Interview Guide for Administrators

Part 1: Basic Information
1. What is your academic background?
2. What do you currently see as your role and responsibility at your institution?
3. For roughly how long have you been involved with portfolio assessment?

Part 2: Key Structure of System of Portfolio Assessment
1. Could you briefly describe the structure of portfolio assessment in your program?
    c) Could you direct me to any literature explaining this model in detail?
2. What are the main aims and principles of portfolio assessment in your program?
    d) Do you know if this structure was modeled on or influenced by any previous models or literature?
    e) Do you know of any other programs that have been influenced by your program's model?

Part 3: Experience with the Practice of Portfolio Assessment

1. How would you describe your current experience with portfolio assessment? Please describe in detail what your regular tasks are?
2. What do you value/like or dislike in portfolio assessment at your institution/programme? Why?
    a) Have these views changed over time? If so, why do you think that is?
3. Do you feel that your colleagues mostly share your views?
    b) If not, is there any factor to which you would attribute this difference in views?
4. Do you feel that teachers utilizing portfolio assessment share your views?
5. Are you aware of the views on portfolio assessment of students in your program? If so, how would you summarize them?

Part 4: Process of Implementation and Development

1. Are you aware of who was most responsible for the decision to introduce portfolio assessment to your program? Do you know roughly when and how the decision was made?
2. Are you aware of any particular reasons behind the initial decision to implement portfolio assessment?
    a) If not, would you say the general reasons were primarily internal or external?
3. How were administrators initially familiarized with portfolio assessment?
4. How would you describe the hoped-for benefits of implementing portfolio assessment? Have these ideal benefits changed over time? If so, why do you believe that is?
5. What would you describe as the first step to implementing portfolio assessment to your program?
    a) Are you aware how long the implementation process took to begin after the decision to introduce portfolio assessment was made? Were there any causes for delay?
6. Did you have an role in development of portfolio assessment in your program? If so, how would you describe your role in the process?
7. What major steps or milestones would you discern in the development of the portfolio assessment system of your program? How would you describe them?
8. What major risks or challenges have occurred in the process of implementing this system? What have been the plans or steps to address these risks and challenges?

Part 5: Teacher Training and Support

1. How did your program introduce teachers to the idea of portfolio assessment? Was there any initial resistance? Is there any continuing resistance at the moment?
2. Would you describe the process of how teachers in your program are trained for the practice of portfolio assessment? Are there any major steps or milestones?
3. How are teachers chosen for participation in portfolio assessment? Is it a requirement for all teachers in the program?
4. Have there been any common challenges in the training process from the administrative side? How would you describe them?
    a) Do you have any notable examples of individual problems with the process?
5. What support is offered to teachers experiencing challenges with or resistance to portfolio assessment training? Do you feel this support has been effective? Would you suggest any changes?
6. Have there been any challenges involving how teachers evaluate portfolios?

7. Are there any ongoing training or support options available to teachers in your program that may experience challenges? Would you describe them? Is staff satisfied with these options?

b) Is there mandatory ongoing training or support? If so, how would you describe staff feelings on this?

Part 6: Current Challenges and Future Direction

1. What would you describe as the current major challenges involved with portfolio assessment in your program? What is being done to address these challenges?
2. Would you describe what you see as the future of portfolio assessment in your program? Do you see it as expanding? Shrinking? Continuing as it currently is? Why?
3. Do you have any role in the future development of portfolio assessment in your program? If so, what is that role?
4. Who or what do you believe has the largest impact on the future direction of portfolio assessment in your program? Why?
5. Do you feel that implementing portfolio assessment in your program has produced its expected benefits? Why or why not?

a) Do you believe there have been any drawbacks? If so, why and are there any factors to which you would attribute these drawbacks?

6. If you could change any past or present decision or step in the implementation process, would you change anything? Why or why not?
7. Do you have any advice or recommendations for other programs looking to implement portfolio assessment? Would you recommend it to other programs at all?