



Research Paper

Identification and Extraction of the Formal and Content-Based Principles for Developing Educational Portfolios



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Received: 2025/06/02

Revised: 2025/09/04

Accepted: 2025/10/12

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Keywords:

Educational Portfolio, Process-Oriented Assessment, Systematic Review, Content Validity

Abstract

Given the pivotal role of portfolios as a tool for process-oriented assessment, the primary aim of this study was to identify the formal and content-based principles for developing educational portfolios. The study employed a qualitative approach using a systematic review methodology. The data sources comprised all available resources addressing educational portfolios and their development characteristics. Accordingly, Persian-language sources published between 2009 and 2024 and English-language sources published between 2007 and 2024 were examined in domestic scientific databases, including Noormags, Magiran, IranDoc, and SID, as well as international databases and publishers, including ScienceDirect, Scopus, Elsevier, and Springer. The search was conducted using the keywords portfolio, principles of portfolio development, portfolio characteristics, portfolio objectives, and criteria for portfolio writing. The study sample consisted of all sources accessible to the researcher. Criterion-based sampling was employed, with the inclusion and exclusion criteria comprising accessibility, publication by reputable publishers and journals, and availability in Persian or English. Data were collected using a researcher-developed checklist. Document analysis was employed for data analysis. The content validity ratio (CVR) was used to determine the validity of the identified principles. The findings indicated that ten formal principles were identified: completing the information on the cover page, including a table of contents, providing a student profile sheet, including a quarterly teacher self-assessment form, providing biweekly feedback on students' academic and educational progress, including a seasonal parent form, thematic categorization, maintaining an appropriate physical volume, separating subject-specific documents, and observing aesthetic considerations. Ten content-based principles were also identified: reflecting non-cognitive learning outcomes, demonstrating students' diverse skills, documenting interactions with classmates, teachers, and parents, documenting weaknesses and errors, addressing multiple intelligences and talents, reflecting authentic activities, providing practical recommendations for future teachers, documenting statements, demonstrating innovation in presenting a comprehensive picture of the student, and ensuring that final decisions are consistent with the contents of the portfolio. The validity coefficient was 0.87 for the formal principles and 0.73 for the content-based principles. The identified principles can serve as a standardized basis for developing and evaluating educational portfolios, comprehensively documenting teaching and learning activities, and preventing the arbitrary or preference-based development of portfolios.

Citation: Yousefzadeh Choosari, M., & Ahmadi, A. (2026). Identification and Extraction of the Formal and Content-Based Principles for Developing Educational Portfolios. *A Review of Theorizing of Behavioral Sciences*, 3(1), 29-38. doi: [10.22098/j9032.2026.20798.1082](https://doi.org/10.22098/j9032.2026.20798.1082)

Introduction

In recent years, many countries have undertaken reforms in their educational and assessment systems. One form of assessment that can evaluate students' abilities comprehensively, as well as the instructional process and its outcomes, is the portfolio (*M Khairu Rizal et al., 2023*). A portfolio is a tool for collecting and documenting information about students' strengths and weaknesses and is beneficial to both teachers and students. Teachers can use this information to improve their instructional methods based on their understanding of learners, while students can use portfolio information for self-assessment, self-evaluation, and monitoring their progress toward learning objectives. In addition, portfolios help students and teachers identify and develop their talents (*Nastiti et al., 2022*). As an effective assessment experience, portfolio-based assessment can serve as a starting point for further and more systematic efforts to assess non-cognitive learning in schools (*Hassani & Ahmadi, 2007*). The term *portfolio* was first used by photographers and artists, who presented collections of their photographic works to prospective clients. In many cases, assessment emphasizes cognitive aspects while neglecting other dimensions, particularly affective and psychomotor aspects (*Nurlaili, 2024*).

Portfolio assessment is not a new approach; rather, it has long been used in the graphic arts to promote artists' professional development. The word *portfolio* is derived from the Italian term *portafogli* in the early eighteenth century. *Portra* refers to "carrying," whereas *poglio* means "leaf" or

"sheet." In general, *portfolio* refers to something used to carry loose papers and documents in a portable bag (*Lam, 2024*). Initially, the term portfolio was used to describe a collection of unstructured documents or materials. In recent years, however, portfolios have served as tools for archiving, documenting, and assessing students' growth and have been recognized as effective instruments for learning, development, communication skills, and cultural literacy. In Iran, the descriptive assessment system was first implemented in 2005 (*Hassani & Ahmadi, 2007*). Portfolio-based assessment is useful for establishing effective communication between parents and schools and thereby increasing parental involvement in children's education (*Madadlou et al., 2020*). A portfolio is an appropriate tool for fostering the development of students' individual skills and independence and provides in-depth, precise, and comprehensive feedback on their overall performance (*Masharova et al., 2023*). A portfolio is a collection of students' work that demonstrates their growth, reflection, and academic progress in a particular area. It also provides a more accurate and authentic representation of students' progress (*Woolfolk & Margetts, 2012*). As a tool for documenting students' competencies, portfolios create opportunities for students to become more active and engaged and enable them to use their strengths strategically to address their weaknesses through planning (*M Khairul Rizal et al., 2021*). Portfolios are essential for fostering learners' metacognitive skills (*Barbera, 2009*). They can provide information about students' classroom,

extracurricular, and co-curricular activities (Deeba et al., 2023). Portfolios are also appropriate for strengthening self-regulation skills and emphasizing self-assessment and its criteria. Furthermore, portfolios are among the most important tools for enhancing interaction between schools and families (Lam, 2024). One of the major advantages of portfolio assessment is its capacity to provide timely and relevant feedback to students (Zhang, 2021).

The development of a portfolio requires attention to a set of principles commonly referred to as formal or structural principles and content-based principles. Formal principles refer to the structural characteristics of a portfolio, which can be viewed as an album containing diverse representations of students' development in knowing, performing, and applying knowledge at different stages of the learning process. Content-based principles, in contrast, concern the nature of the components and elements included in the portfolio and represent various decisions and interventions within the teaching–learning process aimed at responding to learners' diverse needs (Zhang & Yang, 2022).

One of the most important rationales for conducting the present study is to provide a foundation for developing standardized portfolios, prevent the arbitrary and unscientific preparation of portfolios, and support novice and less-experienced teachers who lack practical experience in portfolio development. In many portfolios, collections of tasks and activities are compiled without a clear purpose and remain disconnected from

the objectives, standards, and criteria governing portfolio development (Ghareh Daghi, 2019). Portfolio-based assessment is also not implemented appropriately in schools. The portfolio-based assessment practices implemented in schools to date require innovative models that are aligned with changes in society and technology and with students' evolving needs. Furthermore, studies have shown that schools encounter various challenges in preparing portfolios and implementing portfolio-based assessment, including the high volume of written materials, teachers' lack of knowledge regarding how to complete portfolio content, difficulties in explaining the process to parents, and large numbers of students (Hamedi & Neyrizi, 2013). In many cases, assessment continues to emphasize cognitive aspects while neglecting affective and psychomotor dimensions (Nurlaili, 2024).

Given the issues discussed above, the present study sought to identify the formal and content-based principles for developing educational portfolios. Accordingly, the main research question was as follows:

What are the formal and content-based principles for developing educational portfolios?

Review of the Literature

Relevant studies related to the present research include the following. Lam (2024), in a study entitled *Enhancing the Quality of Portfolio Assessment*, found that although there is a broad understanding of the importance of portfolio assessment in education, substantial differences exist in its

implementation across schools. Many teachers expressed concerns about the lack of a framework and standards for its implementation, which has resulted in inconsistency and a lack of uniformity in assessment practices. Moreover, many teachers reported feeling inadequately prepared to design and implement portfolios and identified insufficient training and resources as major barriers.

Zhang and Yang (2022), in their study entitled *Analysis, Discussion, Implementation, and Use of Educational Portfolios*, conceptualized the portfolio as a collection of multidimensional evidence of learning that can be used to assess learning outcomes.

M Khairul Rizal et al. (2021), in a study entitled *Portfolio Assessment in Schools*, demonstrated that teachers need to be trained in portfolio-writing criteria and should work toward establishing qualitative criteria and standards for the systematic and scientific development of portfolios.

Vorotnykova and Zakhar (2021), in a study entitled *Teachers' Readiness to Use Portfolios*, found that teachers, particularly novice teachers, need to acquire greater experience in using portfolios and interpreting portfolio-based evidence.

Awang et al. (2013), in a study entitled *Assessing Students' Attitudes and Performance in Teacher Education*, found that only 50% of teachers used portfolios. Most teachers lacked sufficient proficiency in portfolio implementation and tended to seek

simpler assessment tools for measuring academic progress.

Petrová and Fasnerová (2012), in their study entitled *Analysis and Examination of the Implementation of Electronic Portfolios in Malaysian Schools*, found that there was no established model or guideline for portfolio use that could serve as a reference for teachers in implementing portfolios in teaching and learning.

Amsami (2016), in a study entitled *Identifying the Problems of Using Portfolios as a Method for Assessment and Enhancing Learning*, found that most teachers did not adhere to portfolio development guidelines, lacked sufficient knowledge, and made limited efforts to understand how portfolios should be implemented.

Gholizadeh et al. (2014), in their comparative study entitled *A Comparative Analysis of Assessment Tools in Iran and Finland*, found that portfolios enable students to perform their work to the best of their abilities, encourage them to collaborate and work with other students, and ultimately contribute to the improvement of classroom discussions and interactions.

Mousavipour and Nasrollahi (2024), in a study entitled *Using Portfolios for Qualitative Assessment of Students by Primary School Teachers*, found that a portfolio is a tool through which teachers, with the active participation of students and their parents, can obtain valid and necessary information for a comprehensive understanding of learners' developmental dimensions across different areas of learning. The authors identified

portfolios as one of the most effective approaches to assessment.

Tashi Shamsabadi et al (2022), in a study entitled *The Effect of Electronic Portfolios on Habits of Mind*, demonstrated that, unlike traditional approaches based primarily on direct transmission of knowledge, the use of portfolios for assessment promotes habits of mind and facilitates deeper learning.

Aghazadeh (2022), in a study entitled *A Review of Innovative Assessment Methods in Science Education*, found that the use of portfolios can foster self-assessment skills and deep and effective learning while increasing students' motivation and interest in sustained learning.

Tahmasebzadeh Sheikhlari et al. (2019), in a study examining the *Effectiveness of Portfolios in the Descriptive Assessment System from the Perspective of Primary School Teachers*, found that teachers' familiarity with portfolios was below the moderate level.

Finally, *Razapour (2016)*, in a study entitled *Examining the Achievement of Educational Objectives*, found that portfolio use, as one of the objectives of qualitative and descriptive assessment, can contribute to the development of students' self-reflection, metacognitive strategies, self-regulation, and thinking skills, as well as facilitate the provision of appropriate feedback, provided that the portfolio is properly developed.

Method

The study employed a qualitative approach and a systematic review methodology. The

data sources comprised all available resources addressing portfolios and their development characteristics. Accordingly, Persian-language sources published between 2009 and 2024 and English-language sources published between 2007 and 2024 were examined in domestic scientific databases, including Noormags, Magiran, IranDoc, and SID, as well as international databases and publishers, including ScienceDirect, Scopus, Elsevier, and Springer. The search was conducted using the keywords *portfolio*, *principles of portfolio development*, *portfolio characteristics*, *portfolio objectives*, and *criteria for portfolio writing*.

The study sample consisted of all sources accessible to the researcher that addressed portfolios and their characteristics. Criterion-based sampling was employed, with the inclusion and exclusion criteria comprising accessibility, publication in reputable journals and by reputable publishers, and availability in either Persian or English. Initially, 60 sources were identified. Following the screening process, 37 sources, including 12 Persian-language and 25 English-language sources, were selected for analysis.

Data were collected using a researcher-developed checklist, and document analysis was employed as the method of data analysis. The Content Validity Ratio (CVR) was used to establish the validity of the identified principles. Accordingly, the identified principles were submitted to 10 experts in educational measurement and assessment, educational psychology, curriculum planning, and educational technology for evaluation. The Lawshe coefficients were 0.87 for the

formal principles and 0.73 for the content-based principles. According to the Lawshe table, the minimum required level of agreement for a panel of 10 experts is 0.62. Therefore, the identified principles met the required validity criterion.

Findings

1. What Are the Most Important Formal Principles for Developing an Educational Portfolio?

Table 1. Formal Principles for Developing an Educational Portfolio

No.	Formal Principles	Sources from Which the Principles Were Derived
1	Student information on the cover page	<i>Ghareh Daghi (2019); Aghazadeh (2022)</i>
2	Table of contents	<i>Balaban (2020); Woolfolk and Margetts (2012)</i>
3	Student profile sheet	<i>Hassani and Ahmadi (2007)</i>
4	Teacher self-assessment form completed every three months	<i>Nastiti et al. (2022)</i>
5	Student academic–educational progress form completed every two months	<i>Petrová and Fasnerová (2012)</i>
6	Parent report form	<i>Deeba et al. (2023)</i>
7	Thematic classification	<i>Zhang and Yang (2022)</i>
8	Appropriate physical volume	<i>Amsami (2016)</i>
9	Systematic arrangement of evidence for each subject	<i>Deutscher and Winther (2018)</i>
10	Observance of aesthetic considerations	<i>Alajmi (2019)</i>

Based on the information presented in Table 1, the most important formal principles for developing an educational portfolio include providing student information on the cover page, a table of contents, and a student profile sheet; including a teacher self-assessment form completed every three months; providing feedback; including a student academic–educational progress form completed every two months; incorporating a parent form to provide periodic information about students’ progress; organizing and structuring the portfolio through appropriate classification and layering; maintaining an appropriate physical volume; placing the materials related to each subject together; and observing aesthetic considerations throughout the development of the portfolio.

2. What Are the Most Important Content-Based Principles for Developing an Educational Portfolio?

Table 2 presents the content-based principles and the sources from which they were derived.

Table 2. Content-Based Principles for Developing an Educational Portfolio

No.	Content-Based Principles	Sources from Which the Principles Were Derived
1	Types of non-cognitive learning	<i>Nurlaili (2024); Beckers et al. (2019)</i>
2	Diverse abilities and skills	<i>Harun et al. (2021); Stefani et al. (2007)</i>
3	Nature of interactions with classmates, teachers, and parents	<i>Zhang and Yang (2022); Deutscher and Winther (2018); Barbera (2009)</i>
4	Students’ strengths and weaknesses	<i>De Fina (1992)</i>
5	Multiple intelligences and different types of talents	<i>Nurlaili (2024); Bagheri amrehei and Fallah (2018)</i>
6	Authentic activities	<i>Lam (2024); Masharova et al. (2023)</i>

7	Practical recommendations for the subsequent grade level	<i>Birgin and Baki (2007)</i>
8	Documentation of performance	<i>Nastiti et al. (2022); Tahmasebzadeh Sheikhlari et al. (2019)</i>
9	Teacher initiative and innovation	<i>Mooney Simmie (2007)</i>
10	Alignment of final decisions with performance	<i>Lam (2024); Hamed and Neyrizi (2013)</i>

Based on the information presented in Table 2, the most important content-based principles for developing an educational portfolio can be summarized as follows: the portfolio should reflect various forms of students' non-cognitive learning; demonstrate students' diverse abilities and skills; reflect the nature of their interactions with classmates, teachers, and parents; include students' weaknesses and errors across different subject areas; provide information on students' multiple intelligences and various talents; reflect students' authentic activities; contain practical recommendations regarding how teachers should interact with students in the subsequent grade level; ensure that all statements and descriptions included in the portfolio are properly documented; incorporate teacher initiative and innovation in presenting a comprehensive profile of the student; and ensure that the final decisions and statements used for assessment are consistent with the contents of the portfolio.

Discussion and Conclusion

The findings of the present study regarding the formal principles for developing educational portfolios are consistent with the results of previous studies conducted by *Hassani and Ahmadi (2007)*, *Ghareh Daghi (2019)*, *Aghazadeh (2022)*, *Nastiti et al. (2022)*, *Petrová and Fasnerová (2012)*, *Balaban (2020)*, *Deeba et al. (2023)*, *Zhang*

and Yang (2022). Likewise, the findings concerning the content-based principles for developing educational portfolios are consistent with those reported by *Tahmasebzadeh Sheikhlari et al. (2019)*, *Stefani et al. (2007)*, *Barbera (2009)*, *Lye and Koh (2014)*, *Deutscher and Winther (2018)*, *Beckers et al. (2019)*, *Mooney Simmie (2007)*, *Harun et al. (2021)*, *Zhang and Yang (2022)*, *Masharova et al. (2023)*, and *Lam (2024)*.

Overall, educational portfolios can be regarded as highly important tools for collecting information about and gaining insight into learners across various cognitive and non-cognitive domains, identifying talents, recognizing strengths and weaknesses, fostering motivation and interest, enhancing self-confidence and self-directed learning, promoting active parental and family involvement, facilitating teamwork and self-assessment, reducing test-related anxiety and stress, and supporting judgments and decisions regarding students' academic progress and promotion to the next grade level. Accordingly, achieving these objectives requires portfolios to be developed in accordance with formal and content-based principles as well as scientifically and internationally recognized standards.

From a formal perspective, portfolios should have an appropriate and aesthetically appealing structure, contain information and

forms documenting learners' characteristics and individual and personal attributes, and employ an appropriate thematic classification system that facilitates rapid and easy access to essential information. From a content perspective, portfolios should encompass diverse talents, intelligences, educational and developmental skills, and various forms of non-cognitive learning. They should also reflect the nature and forms of interaction among students, between teachers and learners, and between teachers, colleagues, and families. Furthermore, portfolios should provide relevant stakeholders and authorized individuals with continuous and direct feedback regarding students' activities and their progress throughout the teaching-learning process.

Based on the findings of the present study, it is recommended that teachers, school administrators, and educational and executive authorities consider the identified formal and content-based principles as a basis for developing educational portfolios. In developing portfolios, due attention should be given to non-cognitive learning outcomes including reasoning, responsibility, teamwork skills, aesthetic dimensions, critical-thinking and problem-solving skills, and project-based learning alongside cognitive dimensions.

The present study examined the formal and content-based principles of portfolio development. Future research is therefore recommended to investigate other principles and dimensions involved in portfolio development. Further studies could also examine the challenges associated with portfolio development from teachers'

perspectives. In addition, comparative research is recommended to examine portfolio development practices within Iran's educational system in comparison with those of other educational systems.

Author Contributions

This article was extracted from a master's thesis.

Acknowledgments

The authors would like to express their sincere gratitude to the experts who contributed to the evaluation of the validity of the findings.

Conflict of Interest

The authors declare that there is no conflict of interest.

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