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INTERDISCIPLINARY PROJECT-BASED LEARNING FOR DEVELOPING STUDENTS' RESEARCH COMPETENCE IN CREATIVE PEDAGOGY

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Abstract. Creative pedagogy is often associated with imagination and expression, while research competence is associated with systematic inquiry; in university practice the two are frequently taught apart. This literature-based thesis examines how interdisciplinary project-based learning (PjBL) can connect them. Drawing on research published since 2019 on creative pedagogies, project-based and research-based learning, and interdisciplinary education, it argues that a well-designed interdisciplinary project provides a natural sequence of research activities: formulating a driving question, gathering information from more than one discipline, analysing evidence and presenting findings to an audience. Each stage is linked to a feature of creative pedagogy, such as generating and probing ideas, collaborating and producing artefacts. The review also identifies recurring difficulties, including the weak use of student-generated questions, unclear interdisciplinary learning goals, and a possible decline in students' motivation for research despite gains in research knowledge. On this basis, the thesis proposes design principles concerning driving questions, disciplinary roles, evidence-based products and assessment. No empirical data are reported; the propositions are intended as a framework for future research.

Keywords: project-based learning; interdisciplinary learning; research competence; creative pedagogy; driving question; evidence-based presentation; higher education.

Introduction and relevance.

Universities increasingly expect students not only to acquire knowledge but also to generate it: to pose questions, collect and interpret evidence and communicate results. In programmes related to creative pedagogy, however, research methods courses and creative studio or practicum courses are often organised separately, so students rarely experience inquiry as part of creative work. Cremin and Chappell (2021), in a systematic review of creative pedagogies, identified seven interrelated features of such practice: generating and exploring ideas, encouraging autonomy and agency, playfulness, problem-solving, risk-taking, co-construction and collaboration, and teacher creativity. Several of these features, notably exploring ideas, problem-solving and collaboration, are also elements of research. This overlap suggests that creative pedagogy and research competence can be developed through a shared format rather than in parallel courses.

Project-based learning is a strong candidate for such a format. Reviews indicate that PjBL in higher education is associated with a range of cognitive, affective and behavioural outcomes, although these outcomes are measured inconsistently (Guo et al., 2020), and a meta-analysis by Zhang and Ma (2023) reported an overall positive effect of PjBL on students' learning outcomes. When projects cross disciplinary boundaries, they also reflect the nature of real research problems, which seldom fall within one subject. The relevance of this thesis therefore lies in clarifying how interdisciplinary PjBL can be organised so that it deliberately builds research competence within creative pedagogy.

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Aim.

The aim of this thesis is to substantiate theoretically how interdisciplinary project-based learning can link creative pedagogy with other disciplines and support the development of students' research competence, understood here as the ability to ask researchable questions, gather information, analyse evidence and present findings. The thesis is based on a review of literature and does not report empirical results.

Theoretical and methodological basis.

The thesis draws on four strands of recent research. The first is the conceptualisation of creative pedagogies by Cremin and Chappell (2021) outlined above. The second is research on PjBL. Markula and Aksela (2022) analysed how teachers implement projects and found that collaboration, artefact creation, technology use and scientific practices such as investigation, presenting results and reflection were readily realised, whereas driving questions, student-generated questions and student-set learning goals were more difficult to implement. The third strand is research-based learning. Wessels et al. (2021) reported that students in research-based courses improved in the cognitive dimensions of research competence, while most affective-motivational dimensions declined; instructors' interest in students' work predicted greater research interest and enjoyment. The fourth strand concerns interdisciplinarity. In a review of interdisciplinary engineering education, Van den Beemt et al. (2020) noted that defining learning goals and assessment remains a persistent challenge and that interdisciplinary skills require deliberate pedagogy and authentic team experience. Perignat and Katz-Buonincontro (2019) found that STEAM education, which integrates the arts with science, technology, engineering and mathematics, is defined in widely different ways and that outcomes such as creativity and problem-solving are rarely reported.

Discussion.

Asking questions. Research begins with a question, and in PjBL this function is served by the driving question. In an interdisciplinary project within creative pedagogy, the driving question should require more than one disciplinary perspective, for example how a local cultural tradition can be presented to children through music, visual art and digital media while remaining historically accurate. Because student-generated questions are among the hardest elements to implement (Markula & Aksela, 2022), teachers may need to model how an open interest is narrowed into a researchable question. This links research competence to the creative pedagogy feature of generating and probing ideas.

Gathering information. Interdisciplinary teams can assign members to disciplinary roles, each responsible for sources and methods typical of that field: archival or literature searches, observation, interviews or analysis of artworks. Students thereby learn that what counts as relevant evidence depends on the discipline, and teams must negotiate how different kinds of information fit together. This negotiation corresponds to the co-construction and collaboration that Cremin and Chappell (2021) describe.

Analysing evidence. Creative projects may move quickly from an idea to a product, bypassing analysis. To prevent this, intermediate milestones can require teams to justify design decisions with evidence, compare alternatives and record why options were rejected. In this way problem-solving and risk-taking, both features of creative pedagogy, become accountable to evidence rather than to preference alone.

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Presenting findings. The public product of a project, such as an exhibition, a performance, a lesson or a digital resource, should be accompanied by a research account that states the question, sources, analysis and limitations. This combination teaches students to communicate both creatively and scientifically. Two cautions follow from the reviewed literature. First, gains in research knowledge do not guarantee sustained motivation (Wessels et al., 2021), so teachers should show genuine interest in students' questions and products. Second, because interdisciplinary learning goals are hard to define (Van den Beemt et al., 2020), assessment criteria for each research stage should be explicit from the outset.

Conclusion and practical implications.

The reviewed literature suggests that interdisciplinary PjBL can serve as a bridge between creative pedagogy and research competence, because the stages of a well-structured project correspond to the stages of research and to several recognised features of creative pedagogy. This conclusion is theoretical and should be tested empirically. For practice, the analysis implies: (1) formulating driving questions that require at least two disciplines and allowing students to refine them; (2) assigning disciplinary roles within teams for gathering information; (3) setting evidence-based milestones before the final product; (4) requiring a research account alongside each creative product; and (5) using rubrics that assess questioning, information gathering, analysis and presentation separately. Future studies could compare interdisciplinary and single-discipline projects using validated measures of research competence and creativity.

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