INSTITUTE FOR ADVANCED STUDY
IN PROBLEM-BASED LEARNING

ANNUAL REPORT 2024

INSTITUTE FOR
ADVANCED STUDY IN PBL

AALBORG
UNIVERSITY

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INTRODUCTION

Since its establishment in 2022, the Institute for Advanced Study in Problem-Based Learning (IAS PBL) has served as a cross-institutional unit at Aalborg University with the ambition to:

- Maintain and strengthen AAU's distinctive PBL profile
- Expand the university's strong position in PBL research
- Strengthen the synergy between PBL environments and staff engaged in PBL
- Bridge the gap between PBL research and PBL practice
- Ensure that research informs practice

In this 2024 annual report, we highlight the research and development activities that contribute to realising these strategic goals. Across IAS PBL's research groups and initiatives, new projects have been launched, PBL teaching practices have been developed, and collaborations have been strengthened.

Throughout the year, IAS PBL has continued to grow as a cross-institutional hub for PBL research and development. We are proud of the progress made and grateful to all colleagues for their dedication and contributions to advancing PBL at AAU.

PROFESSOR THOMAS RYBERG
Director,
Institute for Advanced Study in PBL

ORGANISATION, RESEARCH GROUPS AND UNITS

ORGANISATION

The Institute for Advanced Study in Problem-Based Learning (IAS PBL) is a cross-faculty unit that was established in 2022 to bring together PBL researchers and practitioners across the university's faculties. Thus, the unit supports all faculties and departments across AAU (see figure 1). IAS PBL is directly linked to Aalborg University's management and reports, at an overall level, to the university's Pro-Rector (see figure 2).

In 2023, the first **IAS PBL strategy** was finalised, setting out a clear overall vision for the direction of IAS PBL's activities. The strategy identifies four key objectives, each supported by specific goals designed to guide the realisation of the vision and ensure strategic alignment:

- Leading the field of international PBL research and breaking new grounds for PBL research and pedagogical practice
- Strengthening research-based pedagogical staff development and educational leadership activities
- Cultivating and enhancing a research-based approach to the educational development of PBL and pedagogical practice across Aalborg University
- Enhancing outreach and dissemination of knowledge in the field of PBL and pedagogical practice

IAS PBL comprises several research groups, all of which are connected to different AAU departments and IAS PBL administrative units. In the following, these groups and units are presented individually

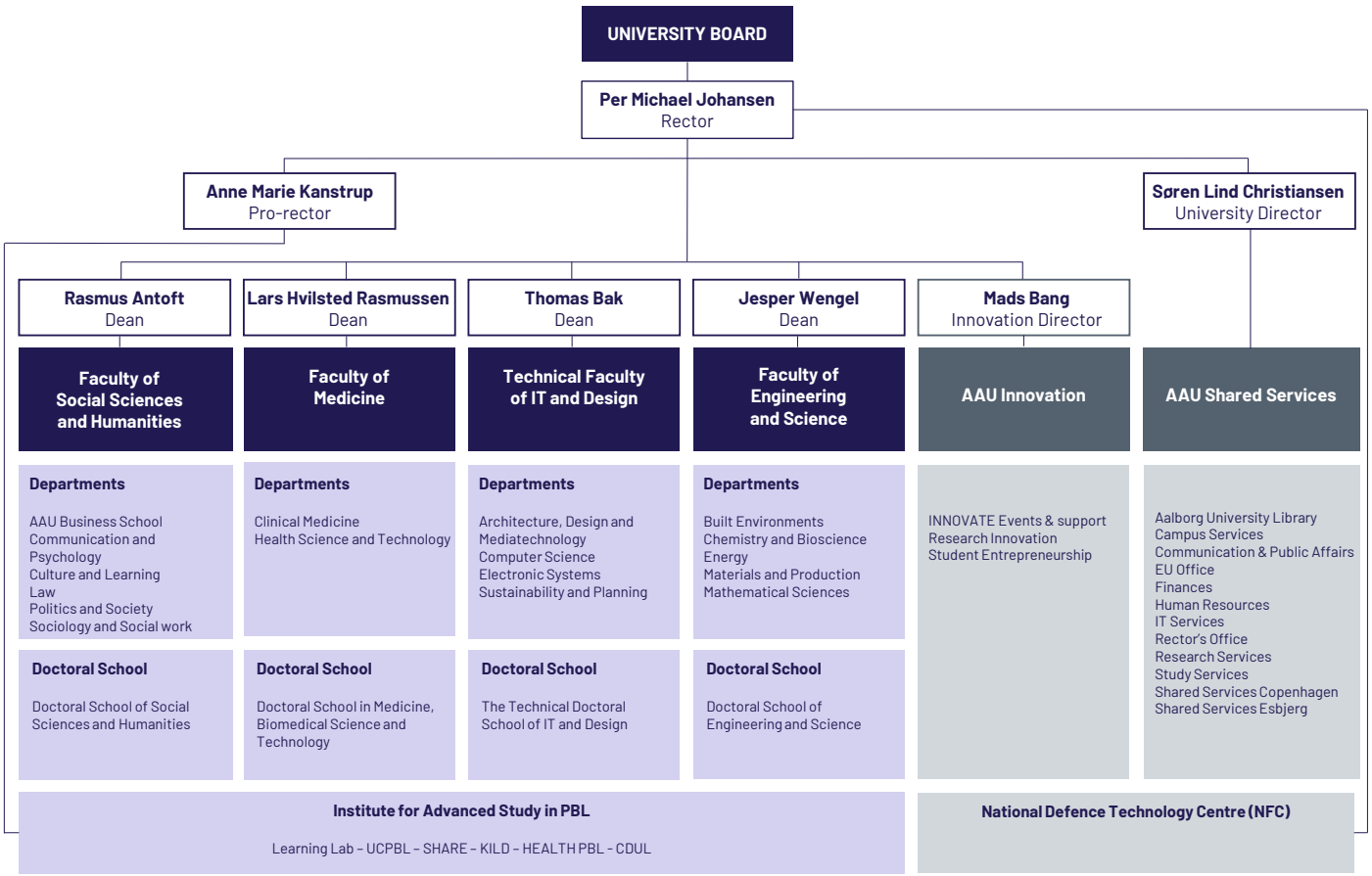


Figure 1: Aalborg University's organisational chart

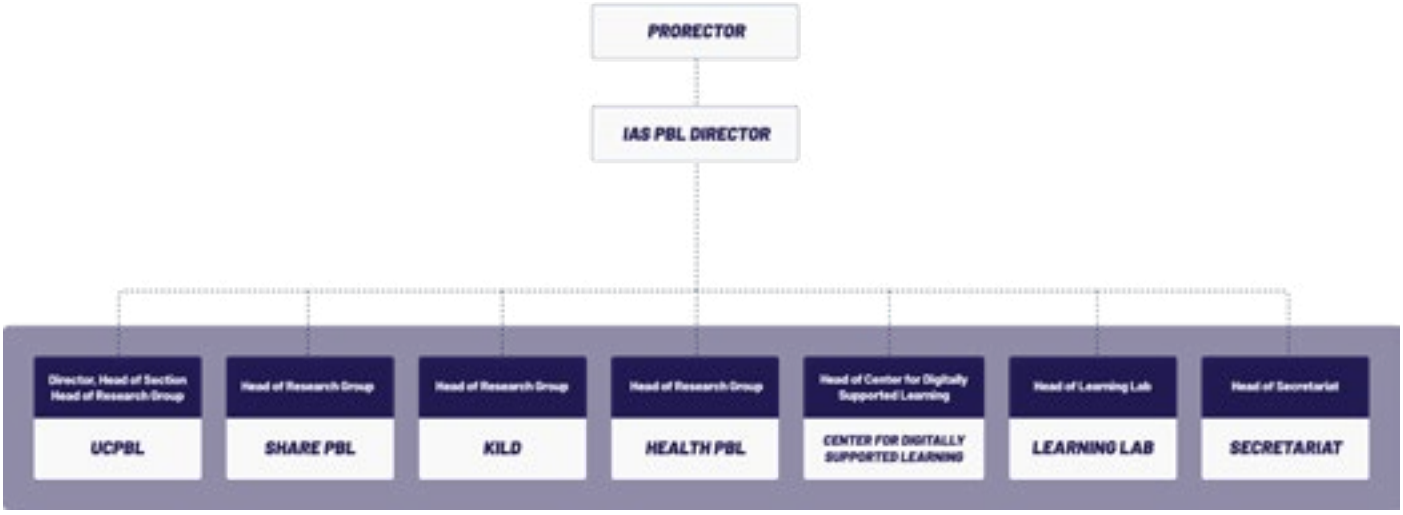


Figure 2: Institute for Advanced Study in PBL organisational chart

THE AALBORG UNESCO PBL CENTRE

The Aalborg Centre for Problem-Based Learning in Engineering Science and Sustainability (UCPBL) is a category 2 centre under the auspices of UNESCO. The centre was formally launched in 2014.

The overall strategic goal of the Aalborg UNESCO PBL Centre, UCPBL, is to facilitate universities and other higher education institutions to take an active role in educating engineers and scientists, so they can participate and contribute to the development of sustainable solutions to the present and emerging social, economic, and environmental challenges. UCPBL conducts world-renowned research in problem-based learning within engineering and science education and teaches problem-based learning.

UCPBL is the largest research group affiliated with IAS PBL. In 2024, the group consisted of a total of 28 academic staff members, excluding externally affiliated staff. All UCPBL staff members are employed at the Department of Sustainability and Planning under the Technical Faculty of IT and Design.

SHARE-PBL

Established in August 2022, the research group on Social and Human science Approaches to Research in Education and Problem-Based Learning (SHARE-PBL) is an interdisciplinary research group dedicated to developing our scientific understanding and practice regarding PBL, problem-oriented project work, and other supporting pedagogical practices from a social science and humanities (SSH) perspective.

In its current work, the group emphasises research on interdisciplinary and digital aspects of problem- and project-based learning as well as staff development associated with teaching in higher education programmes. Focusing on social and human science perspectives, SHARE-PBL furthermore contributes to the development of pedagogical concepts and models within the tradition of problem- and project-based education.

In 2024, SHARE-PBL consisted of a total of 13 staff members employed at five different departments under the Faculty of Social Sciences and Humanities.

KILD/L-ILD

The research groups Communication, IT and Learning Design (KILD) and IT and Learning Design (L-ILD) both explore how digital technologies can be adopted to develop new learning processes in a digital and networked society. This includes a strong interest in how to support PBL through the use of digital learning resources.

The research groups carry out basic research as well as action- and practice-oriented research on IT and learning design in collaboration with external partners. The focus is on facilitating learning and qualifying learning designs to enhance creativity and innovation. This includes a special focus on employing visual and aesthetic practices, game-based learning, design processes and PBL in different learning contexts.

The research groups have a total of 12 staff members affiliated with IAS PBL. They are employed at the Department of Communication and Psychology and the Department of Culture and Learning under the Faculty of Social Sciences and Humanities.

HEALTH-PBL

HEALTH-PBL is an interdisciplinary research team dedicated to research in theory-practice, case- and project-based problem-based learning. Operating within the education domain of the Faculty of Medicine, its members teach at the faculty and support its teaching activities to ensure alignment with Aalborg University's educational profile and PBL principles. HEALTH-PBL is also involved in developing the pedagogical competence of the faculty's teaching staff.

In 2024, HEALTH-PBL consisted of a total of seven staff members, all employed at the Department of Health Science and Technology under the Faculty of Medicine.

LEARNING LAB

Learning Lab delivers research-based pedagogical competence development to new and existing staff members at Aalborg University; this includes the university pedagogy programme, which is a research-based competency development activity that prepares early career university staff, primarily assistant professors and postdocs, for their further teaching careers. The overall objective of the programme is to develop and ensure participants' pedagogical competences in classroom teaching and planning, supervision, and examinations in university courses.

Learning Lab empowers staff to fulfil Aalborg University's commitment to excellence in higher education teaching and learning and builds on current tertiary teaching research to identify and evaluate trends, apply best practices, and address gaps in the University's delivery of higher education practices. Learning Lab aims to develop AAU's organisational capacity and capability concerning high-quality university teaching and learning.

The Learning Lab management team consists of Nikolaj Stegeager (SHARE-PBL), Line Bune Juhl (SHARE-PBL), Merethe Hollen (CDUL) and Xiangyun Du (UCPBL).

Learning Lab Research

IAS PBL researchers from various disciplines and research groups constitute a research network that aims to provide a scientifically grounded perspective on pedagogical development in higher education. The Learning Lab research group seeks to evaluate current pedagogical practices at Aalborg University and compare internal methods with those at other universities and insights from international research literature.

The group aspires to establish a robust body of research on pedagogical competence development to ensure that professional development activities at AAU are based on well-documented, research-informed approaches.

The aim of the Learning Lab research group is to:

- Scientifically assess the current practices at Aalborg University in terms of pedagogical development
- Address the question: What does it mean to teach at a PBL university, from a pedagogical perspective?
- Support cross-disciplinary collaboration to enhance pedagogical practice within IAS PBL and across AAU
- Promote a research-based approach to implementing the Danish Framework for Advancing University Pedagogy and developing teaching portfolios at AAU
- Contribute a scientifically grounded perspective on problem-based approaches to pedagogical development in higher education, with potential relevance for international research communities

Members of the Learning Lab research group include the following researchers from SHARE-PBL and UCPBL Associate Professor Nikolaj Stegeager, Professor Xiangyun Du, Associate Professor Aida Guerra, Associate Professor Niels Erik Ruan Lyngdorf, Associate Professor Maria Hvid Stenalt, Teaching Associate Professor Line Bune Juhl, Assistant Professor Juebei Chen, Postdoc Dan Jiang, and PhD Fellow Karoline Ballieu Kjærgaard.

IAS PBL is funding a PhD fellowship and a research assistant.

CENTER FOR DIGITALLY SUPPORTED LEARNING

The Center for Digitally Supported Learning (CDUL) supports AAU's management, teaching staff, and supervisors by offering pedagogical and technological guidance. Its core mission is to contribute to the ongoing development of digital PBL practices across the university.

CDUL works closely with teaching staff from all faculties to enhance teaching practices through digital and pedagogical innovation. The centre provides insights into integrating digital tools into PBL and stays up to date with the latest learning technologies available to AAU staff. CDUL also draws on current research from IAS PBL to inform its support and development efforts.

To promote knowledge sharing and inspiration, CDUL maintains an active **LinkedIn** presence and produces **The Digital Agora podcast**, featuring teacher-to-teacher conversations focused on the challenges associated with digitally supported learning. Additionally, CDUL actively engages in various projects and initiatives centred around digital technologies and teaching enhancement.

Collaboration is central to CDUL's work. The centre partners with units such as AAU's PBL-digital team, AAU IT Services, and Aalborg University Library, and will continue to foster cross-university collaboration to strengthen shared initiatives.

In 2024, CDUL consisted of a total of 12 staff members.

JOURNAL OF PROBLEM-BASED LEARNING IN HIGHER EDUCATION

The Journal of Problem-Based Learning in Higher Education (JPBLHE) is an official journal of the Institute for Advanced Study in Problem-Based Learning. The journal is international and peer-reviewed and is dedicated to advancing the field of problem-based learning (PBL) within the realm of higher education.

At the core of the journal's mission lies a dedication to publishing original, high-quality research articles and case studies that explore the intricacies of problem-based learning in the context of higher education at the top level of academia.

Published annually, with the addition of special issues, the journal is dedicated to promoting transformative and progressive pedagogical practices, fostering international collaboration, and nurturing the development of teaching and learning experiences.

The journal is led by a dedicated editorial team comprising the following researchers from IAS PBL: Patrik Kjærsdam Telléus (HEALTH-PBL), Bettina Dahl Søndergaard (UCPBL), Jette Egelund Holgaard (UCPBL), Nikolaj Stegeager (SHARE-PBL) and Vibeke Andersson (SHARE-PBL). The journal is overseen by an editorial board consisting of renowned PBL experts from around the globe to ensure that the journal maintains rigorous standards of academic excellence and integrity. The editorial board members are listed on the **JPBLHE website.**

In 2024, the journal published the annual issue, Vol. 12 No. 1, with several research articles and case papers, as well as a special issue, Vol. 12 No. 2 "Essential Readings in Problem-Based Learning".

IAS PBL RESEARCH

IAS PBL RESEARCH FUNDING INITIATIVES

IAS PBL Development Funds – PBL in AAU Missions

In autumn 2024, IAS PBL initiated a process to identify potential research areas for an internal development fund.

Two overarching themes were selected: *Flexible Education* and *Missions and Interdisciplinarity*. Within each theme, a cluster of projects was identified – two projects were identified in *Flexible Education* and four in *Missions and Interdisciplinarity*. By the end of 2024, each cluster submitted a joint project description that connects and integrates the individual initiatives.

The selected development projects will run from 2025 to 2027 and aim to foster cross-group collaboration and innovation within key strategic areas for IAS PBL.

IAS PBL Seed Money

The IAS PBL seed money initiative is an internal funding scheme designed to support the growth of new research and development projects in problem-based learning (PBL). The purpose of the scheme is to support novel ideas that have the potential to grow into larger initiatives and foster new constellations and collaborations, both within IAS PBL and with external partners.

The scheme prioritises proposals that align with IAS PBL's strategic objectives and promote collaboration across research groups, AAU departments, or with external stakeholders.

In 2024, the following six projects were awarded seed money:

- Heatmapping PBL Competence Profiles
- Interdisciplinary PBL through Design and Use of Learning Games
- myPBL-VRMath: Micro-PBL in Mathematics Using Virtual Reality
- PBL Professional Days
- PERSPECT: Exploring Generative AI in PBL Problem Based Learning. New Insights from Students' Perspectives
- TAIL: Teacher Conception of AI Learning, AI Teaching and Approaches to Design

Each of these projects is described individually in the section below.

RESEARCH PROJECTS FUNDED BY IAS PBL

The following section presents an overview of research projects initiated in 2024 with internal funding from IAS PBL. A full list of research projects affiliated with IAS PBL is available **here.**

Heatmapping PBL Competence Profiles

All students at the Faculty of Engineering and Science (ENG) and the Technical Faculty of IT and Design (TECH) participate in a competency workshop during their 8th semester, where they reflect on and document key PBL competencies in a personal profile. These reflections are guided by a structured catalogue covering four competency areas and a total of 48 competencies from which the students can choose.

In this project, an analysis of the submitted profiles was conducted to identify patterns in students' self-selected competencies. The results revealed significant variations: while some competencies, particularly those related to problem-solving and teamwork, were frequently selected, others, such as metareflective competencies, appeared far less often. Notably, the most widely selected competencies were those closely aligned with the core of the AAU PBL model.

The findings suggest that students benefit from a coherent competency framework, but also that a simplified structure, organised around smaller groups of broader themes, may more effectively capture the diversity of their perceived learning experiences. The project has provided valuable insights into how students perceive and communicate their PBL competencies, highlighting a potential need to strengthen metareflective skills in future teaching.

The project has also contributed to academic dissemination, resulting in three conference presentations, two abstracts, one research paper, and a peer-reviewed article scheduled for submission in 2025.

Assistant Professors Giajenthiran (Kalle) Velmurugan and Raimundo Elicer, Professor Euan Lindsay and Associate Professors Stine Ejsing-Duun (UCPBL) and Antonia Scholkmann (SHARE-PBL) participated in the project.

The project has received DKK 44,800 in funding through the IAS PBL seed money scheme.

Interdisciplinary PBL through Design and Use of Learning Games

This project enabled ninth-semester students to collaborate in interdisciplinary project groups to explore how dilemma-based scenarios in Virtual Reality (VR) can be used to support learning about conflict management in a school setting. The users are teacher education students, and the study was conducted in collaboration with the teacher education programme at University College Copenhagen as part of a participatory design study.

Two VR scenarios were developed and evaluated separately. The first scenario depicts a conflict between two pupils that escalates into a physical altercation. The second scenario centres on a pupil showing signs of emotional distress and revealing issues of domestic abuse. Both scenarios were developed using the Unity game engine, with the XR Interaction Toolkit used for VR implementation.

The findings indicated highly positive perceptions of the VR scenarios, with participating students reporting strong engagement and a high degree of realism. The study concludes that VR can effectively facilitate realistic scenarios in which students can safely practice and develop their professional skills.

Professor Thorkild Hanghøj (KILD) participated in the project, which included collaboration with University College Copenhagen.

The project has received DKK 70,000 in funding through the IAS PBL seed money scheme.

myPBL-VRMath: Micro-PBL in Mathematics Using Virtual Reality

This project set out to investigate how Virtual Reality (VR) in a micro-PBL setting could enhance engineering students' motivation and understanding of key mathematical concepts, specifically the vector cross product in linear algebra. Although the project faced several challenges, including time constraints and changes in partner availability, it still led to valuable outcomes and insights.

Two peer-reviewed papers were published and presented at international conferences, contributing to the growing field of immersive learning in STEM education. While a planned workshop at AAU Learning Day was ultimately not carried out due to limited available material and personnel, the project has sparked interest and dialogue across institutional and international networks. Future opportunities for collaboration, including joint workshops and research proposals, remain under consideration. An Erasmus+ application was initiated but not completed due to time limitations. However, the idea remains active, and the team is exploring opportunities.

Associate Professor Bettina Dahl Søndergaard (UCPBL) led the project, which included participants from Karlstad University and Azrieli College of Engineering Jerusalem.

The project received DKK 60,000 in funding through the IAS PBL seed money scheme.

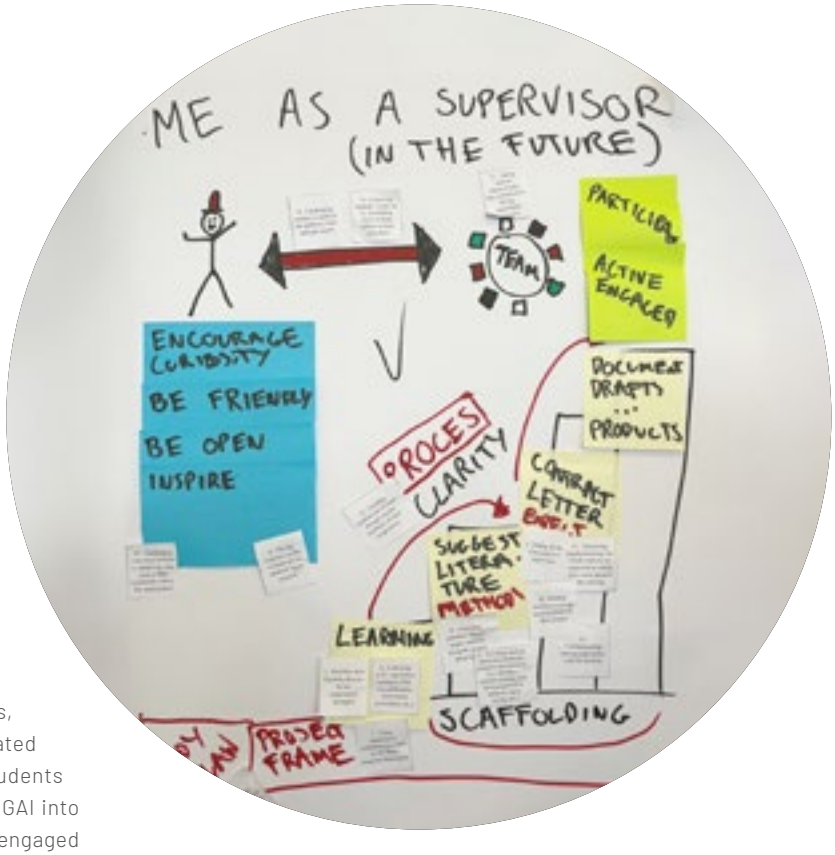
PBL Professional Days

The project aimed to develop a new PBL workshop concept to support progression in students' professional competencies through cross-departmental collaboration and interdisciplinary engagement. The concept, which was entitled ProLab, replaced previous local PBL workshops at the Faculty of Engineering and Science (ENG) and the Technical Faculty of IT and Design (TECH) and brought together approximately 700 students, primarily from TECH, in their 4th or 6th semester. Student feedback highlighted strong satisfaction with the concept and its focus on non-technical competencies essential for future careers.

ProLab offered students the opportunity to choose workshops based on personal interests and needs, promoting motivation and engagement. The format emphasised interdisciplinary collaboration, hands-on activities, and open discussions. Students responded positively to the freedom of choice and the diversity of workshop topics.

Associate Professors Bente Nørgaard, Aida Guerra, Lykke Brogaard Bertel, Niels Erik Ruan Lyngdorf and Assistant Professor Giajenthiran (Kalle) Velmurugan (UCPBL) participated in the project.

The project has received DKK 120,000 in funding through the IAS PBL seed money scheme.



PERSPECT: Exploring Generative AI in PBL Problem-Based Learning. New Insights from Students' Perspectives

This project explored how students at a PBL university experience learning with generative AI (GAI). The aim was to build knowledge and strengthen competencies among AAU faculty, leadership, and educational developers. Through a small-scale design experiment in a pedagogical programme, students engaged in open-ended investigations of their own and their peers' emerging GAI practices.

The project revealed a complex landscape of student experiences, including initial hesitation, uncertainty, and even shame related to the use of GAI. However, the PBL framework enabled students to develop reflective and nuanced approaches to integrating GAI into their learning. The experiment also highlighted how students engaged in collaborative knowledge construction, while educators and other stakeholders were perceived as key authorities guiding the responsible and reflective use of generative AI.

Project results have been disseminated through presentations at the international conference ECCES 2025 and publications in peer-reviewed journals, with two articles accepted and a third in preparation.

Antonia Scholkmann (SHARE-PBL) led this project.

The project received DKK 50,000 in funding through the IAS PBL seed money scheme.

TAIL: Teacher Conception of AI Learning, AI Teaching and Approaches to Design

This project critically investigates the concept of quality education in the context of rapid technological transformation, with a particular focus on artificial intelligence (AI). Anchored in the overarching question of what constitutes good education in the age of AI, the study explored how higher education teachers conceptualise AI teaching and learning, and how they approach the design of learning experiences involving AI. Through a phenomenographic study involving teachers from two Danish universities – one rooted in problem-based learning and the other in a traditional research-intensive model – the project offers nuanced insights into the varying understandings and practices of teachers. Participants were selected based on peer recognition for their active engagement in AI-related educational development.

One article is currently under review, and another publication has contributed to broader scholarly discussions on AI in education. Preliminary findings have been shared with educational leaders through national and institutional leadership programmes. A full research proposal has been submitted to the Independent Research Fund Denmark (DFF).

Associate Professor Maria Hvid Stenalt led the project in collaboration with Antonia Scholkman (SHARE-PBL), Euan Lindsay (UCPBL) and Aarhus University.

The project received DKK 55,000 in funding through the IAS PBL seed money scheme.

Professional Learning Development and Mentorship for Early Career Academics through University Pedagogy Programme

This project focuses on the professional learning and development of early career academics (ECAs), including assistant professors and postdoctoral researchers, as they participate in a university pedagogy (UP) programme. It is a one-year, research-informed initiative designed to provide ECAs with the pedagogical and didactic knowledge and skills necessary to fulfil the role of a university instructor. The project explores the experiences and perspectives of ECAs, as well as how their pedagogical and departmental mentors support them within a professional learning community.

The project is led by Postdoc Dan Jiang (UCPBL) and is affiliated with the Learning Lab Research Group.

EXTERNALLY FUNDED RESEARCH PROJECTS

The following section presents an overview of externally funded research projects initiated or joined by IAS PBL researchers in 2024. A full list of research projects involving researchers affiliated with IAS PBL is available **here.**

2SOSU-AI: Generative AI in Vocational Education and Training. Increasing Participation Opportunities for Bilingual Women in Social Care Programmes

This project explores how generative AI can support female students with Danish as a second language in social and healthcare education. By leveraging GenAI's language capabilities, the project aims to reduce barriers to language, learning, and participation. Using the Learning Factory approach and ethnographic data collection, it generates new insights across educational technology, vocational training, and learning research.

Associate Professor Antonia Scholkmann (SHARE-PBL) leads this project, which includes partners from Center for Anvendelse af IT i Undervisningen på Erhvervsuddannelserne – CIU [Centre for the Application of IT in Vocational Education], the Knowledge Center for Welfare & Assistive Technology (VFV) and 12 Danish Vocational Education and Training Colleges.

The project has received DKK 5,698,592 in funding from the VELUX Foundation.

Best for Us

The project *Best for Us* (in Danish *Bedst for os*) is a large interdisciplinary initiative aimed at developing and implementing an improved, regionally anchored, and family-centred stepped-care model. The model aims to ensure faster diagnostic assessments and provide improved and timely treatment for children and young people experiencing mental health challenges and disorders.

Jacob Gorm Davidsen (KILD) participates in the project, which is led by the Department of Child and Adolescent Psychiatry at Aalborg University Hospital and includes collaboration partners from the Danish Center for Health Services Research and Aalborg, Hjørring, Mariagerfjord and Thisted Municipalities.

The project has received DKK 150 million from the Novo Nordisk Foundation and DKK 30 million from Det Obelske Familiefond.

Building Stronger Universities IV

The Building Stronger Universities (BSU) programme is a capacity-building initiative that aims to enhance the quality of research through long-term institutional development in selected international university environments.

Professor Lone Dirckinck-Holmfeld (KILD) participates in the project in collaboration with Gulu University, Roskilde University and the University of Copenhagen.

The project has received DKK 20 million in funding from the Ministry of Foreign Affairs in Denmark.

Digital Twins for Abundant Feedback: Novel Feedback Paradigms via Explainable Multilingual Natural Language Processing

This project uses natural language processing (NLP) to develop digital twins of assessment and feedback processes, capturing expert judgment to deliver scalable, instant, and explainable feedback to students. By combining frontier research in engineering education and multilingual NLP, the project explores how students engage with and value feedback, expanding our understanding of effective educational practice.

By exploring multilingual NLP for explainable feedback, this project lays the groundwork for scalable, trustworthy assessment tools and opens new research questions regarding how students engage with feedback as well as the way we provide that feedback, expanding our understanding of what defines effective educational practice in engineering. Ensuring feedback explainability is key to maintaining trust and reliability, marking a frontier in multilingual NLP.

The project is led by Professor Euan Lindsay (UCPBL).

The project has been awarded DKK 3 million from the Villum Foundation.

Emerging Technology Literacy and Systems Thinking in STEM: Fostering and Assessing Thinking Skills in the Age of Generative AI

This project explores how systems thinking can be fostered and assessed in first-year STEM education through the System Architecture-Function-Outcome (SAFO) framework and PBL. It also investigates the use of generative AI to support formative assessment of higher-order thinking skills. The research includes a hybrid sabbatical with data collection at AAU and MIT.

The project is led by Associate Professor Lykke Brogaard Bertel (UCPBL). Collaboration partners include MIT and the New Engineering Education Transformation (NEET) program and the Department of Aeronautics and Astronautics (AeroAstro).

Enhancing Institutionalized Transformation through Design, Implement and Evaluate a PBL Pedagogical Development Certificate Program for HITAM, India

This project supports educational transformation in Indian higher education for engineering by strengthening pedagogical leadership among university lecturers. Through a multi-cohort development programme, participants are empowered to design student-centred learning models, engage in the scholarship of teaching and learning, and act as local change agents. The initiative promotes sustainable, institution-wide change by building both individual and organisational capacity for innovation in teaching.

The project is led by Professor Xiangyun Du (UCPBL). Assistant Professor Juebei Chen and Associate Professors Aida Guerra and Søren Hansen (UCPBL) participate in the project.

ENVIHEI: Student-Centered Learning for ENVIronmental Sustainability at Higher Education Institutions

The ENVIHEI project develops and tests innovative, student-centred learning materials to integrate green competences in higher education, addressing key challenges in the EU's GreenComp framework. The project focuses on empowering engineering students and their lecturers to support the green transition and encourage responsible citizenship. Activities include the co-creation and piloting of educational materials, lecturer training, and a winter school for students. Using transformative learning approaches, such as PBL, real-case studies, and service learning, the project promotes transferable, practice-based sustainability education across diverse higher education contexts.

Associate Professor Aida Guerra and Postdoc Dan Jiang (UCPBL) participate in the project, which is led by Universidad De Leon and includes collaboration with Universiteit Hassel, Politechnika Slaska, and Montanuniversitaet Leoben.

The project has received €191,660 in funding from the Spanish Service for the Internationalisation of Education (SEPIE).

Learning to Work with Stakeholders in ESG (Environmental, Social, Governance) Reporting through Digital Inquiry Methods and AI Technologies

This project investigates how digital inquiry methods and AI technologies can support stakeholder engagement in ESG (Environmental, Social, Governance) reporting. The aim is to develop a data-driven ESG framework that integrates external perspectives to enhance strategic decision-making. By improving the understanding and use of ESG data, the project contributes to the development of more sustainable products and services.

Assistant Professor Maria Hvid Bech Dille (KILD) participates in the project.

The project has received funding from the Green Societies seed funding programme at AAU's Faculty of Social Sciences and Humanities.

Organisatorisk trivselskapacitet – unges deltagelse i meningsfulde fællesskaber

Organizational Well-Being Capacity: Youth Participation in Meaningful Communities

The project aims to develop a scalable model for Organisational Wellbeing Literacy (OWL) to enhance youth wellbeing (ages 15–25), targeting the 33% who experience distress. Through cross-sectoral co-creation with young people and professionals, the project explores how organisations can foster meaningful communities. Insights from practice and research inform innovative approaches, culminating in a national model to enhance organisational capacity for youth wellbeing.

Associate Professors Lars Domino Østergaard and Henrik Vardinghus-Nielsen (HEALTH-PBL) participate in the project.

Partnerskab om unges mistrivsel i Aalborg

Partnership on Youth Wellbeing in Aalborg

The project is part of a cross-sector partnership that aims to rethink and strengthen youth wellbeing by involving young people directly in shaping solutions. Through co-creation and local experimentation, the initiative aims to enhance mental health, quality of life, and participation in education, work, and community. Young voices are central to designing new, meaningful approaches that can reverse the trend of rising distress.

Associate Professor Henrik Vardinghus-Nielsen (HEALTH-PBL) participates in the project. Collaboration partners include Aalborg Municipality.

Sustainable Development Lab

Sustainable Development Lab (SD-LAB) is an interdisciplinary course offered to third-semester master's students at AAU Copenhagen as an alternative to a traditional internship. The course combines lectures on sustainability, ethics, design thinking, future thinking, and strategic thinking with hands-on collaboration on real-life problem cases in partnership with external organisations. By working across disciplines and engaging with societal challenges, students gain valuable competencies for future careers in sustainability-driven fields.

Professor Lone Dirckinck-Holmfeld (KILD) leads the project. Heidi Hautopp (L-ILD) participates in the project.

SUS på AAU

SUS at AAU

This project focuses on enhancing Study Development Conversations (SUS) across faculties and programmes at AAU. The aim is to develop a shared template for conducting SUS, supporting student wellbeing, retention, and completion rates. By creating a structured and evidence-informed approach, the project seeks to strengthen the impact of SUS as a tool for academic and personal student support.

Associate Professor Lars Domino Østergaard (HEALTH-PBL) leads the project.

Visualization-Enhanced Undergraduate Wireless Engineering Education through Problem- and Project-Based Learning Approaches (NSF IUSE: Virginia Tech)

This project develops a new PBL-based introductory course in wireless communications on the principles of problem- and project-based learning (PBL/PjBL) and integrating advanced visualisation tools.

The course aims to reverse declining student interest by making wireless concepts more accessible and relevant. It includes a comprehensive, open-access package of teaching materials, lecture plans, projects, and interactive simulations, designed to closely align with industry needs, including emerging topics such as digital twins. The course also supports outreach to pre-university and first-year students, helping to build a stronger, future-ready STEM workforce.

Bettina Dahl Søndergaard (UCPBL) participates in the project, which is led by Virginia Polytechnic Institute and State University.

The project has received USD 399,884 in funding from the U.S. National Science Foundation (NSF): IUSE (Improving Undergraduate STEM Education).

DEVELOPMENT PROJECTS AND INITIATIVES

Revising the AAU PBL Principles

As part of Aalborg University's quality assurance system, the university's PBL principles are reviewed every six years. In 2023-2024, a working group coordinated by IAS PBL conducted an assessment to determine whether a revision of the principles was needed. Based on the group's report, a formal revision process was initiated, and the existing working group has continued its efforts, focusing on drafting revised PBL principles based on the recommendations outlined in the report.

A draft of the revised principles is expected to be submitted for approval in 2025, ahead of which the working group will seek to collect feedback from AAU's teaching staff. Implementation of the new principles is anticipated to begin in 2026.

IAS PBL Consultation and Advisory Services

One of the founding ambitions of IAS PBL is to strengthen the quality and development of problem-based learning across Aalborg University. In alignment with this goal and the IAS PBL strategy, a working group of IAS PBL staff and researchers developed a new service in 2024 to support AAU's educational environments.

The service aims to provide short-term inspiration and counselling courses, long-term collaborative development programmes, and an online PBL portal offering accessible resources. Its goal is to bridge the gap between the educational and PBL practices across AAU and the research conducted within IAS PBL.

Through this initiative, IAS PBL aims to connect educational research with local practice, creating tangible improvements locally and strengthening the university's overall commitment to problem-based learning. A pilot phase is planned for 2025, during which the services will be tested and refined in collaboration with educational environments. The hope is that this initiative will inspire broader engagement and help enhance teaching and learning across AAU.

AAU Learning Day 2024: Celebrating 50 Years of PBL

In 2024, IAS PBL took over the coordination of *AAU Learning Day* – a recurring annual event that aims to inspire teaching practices across Aalborg University.

Under the heading *"PBL: Past, Present, and Future"*, the 2024 event marked the university's 50th anniversary. More than 200 staff members participated across AAU's campuses in Aalborg, Copenhagen, and Esbjerg. The event provided a platform for reflection on the evolution of problem-based learning at AAU – from 1974 to its current applications and future potential in shaping education.

Keynote presentations addressed topics such as sustainable assessment practices, historical and contemporary challenges in education, and the need for a fresh educational paradigm to navigate the changing landscape of higher education. Participants engaged in workshops and discussions on topics such as digital teaching, exam strategies, and the potential of AI in higher education. Outstanding educators were recognised for their contributions to teaching and educational development.

The event was characterised by lively dialogue, collaboration, and a shared commitment to advancing higher education. Moving forward, AAU Learning Day will continue to serve as a central and meaningful opportunity for AAU teaching staff to share practices, build networks, and engage in critical reflection on teaching and learning at AAU.

Teaching Cultures Survey

Learning Lab has continued its work with the international Teaching Cultures Survey, a cross-institutional initiative that explores how teaching is valued and experienced across universities worldwide. The survey focuses on the attitudes, aspirations, and experiences of academic staff concerning teaching and aims to track changes over time in how teaching is perceived and supported within higher education.

At Aalborg University, Learning Lab is responsible for coordinating the survey locally, including distributing questionnaires to academic staff, analysing the results, and advising on their implications. The final round of the three-part survey is expected to be completed in 2025.

Further Development of Course in Educational Management

In 2024, Learning Lab further developed its course on educational management, originally launched in 2022 for study board representatives and administrative staff. The updated version builds on the original concept and responds to the growing need for professional development in educational leadership.

The course supports participants in navigating the everyday challenges and complexities of educational management, with a focus on collaboration across roles and departments.

New PhD Course: University Teaching in Social Science and Humanities

In 2024, Learning Lab developed a new PhD course, *University Teaching in Social Science and Humanities*, aimed at supporting participants to develop a solid foundation for teaching at the university level, based on their own experiences. Throughout the course, participants will actively engage with their own teaching practice, using it as a basis for reflection, experimentation, and peer feedback.

By the end of the course, participants are expected to plan, deliver, and evaluate university teaching, create constructive learning environments, and collaborate effectively with peers to enhance teaching quality.

The course is a mandatory course offered to PhD students at the Faculty of Social Science and Humanities in 2025.

AAU Micro

The field of further and continuing education continues to evolve, driven by increasing demands for lifelong learning, flexibility, and accessible, on-demand formats. In response, CDUL's production team has strengthened its collaboration with all four faculties to develop microcredential courses (AAU Micros) across all academic areas.

In 2024, CDUL supported the development of AAU Micros tailored to various continuing education formats and regular degree programmes. Moreover, CDUL was involved in the development and production of three AAI Micros for the University Pedagogy Programme, covering topics such as PBL, group dynamics, conflict management, and quality assurance. The production team is actively involved in all phases of course development, from initial concept and design to content creation, recording, and implementation.

AI in Education

In 2024, CDUL actively supported the faculties in integrating AI into teaching through approximately 20 presentations and workshops, developed in close collaboration with the vice deans for education.

CDUL also led a cross-unit working group with representatives from AAU's Study Service, the University Library, IT Services, and the PBL Digital team, focusing on updating websites and communication materials about AI for the university's departments and students. In collaboration with all four faculties, CDUL developed a concept to support AAU's teaching staff in addressing emerging AI-related competences. Efforts to secure funding were initiated in 2024 to further strengthen this area in 2025.

AAU Micro on Generative AI and Learning

In 2024, a new AAU Micro course on Generative AI and Learning was developed in a collaboration between CDUL and researchers from IAS PBL and other AAU departments. The course targets teaching staff at upper secondary level and beyond (university colleges, universities, etc.), offering insights into the fundamentals of generative AI, its applications in teaching and learning, and its implications for assessment strategies.

CDUL's Contributions to the PBL Digital Master Plan

As part of AAU's strategic PBL Digital master plan, CDUL has taken a leading role in several key initiatives aimed at strengthening digital competencies and supporting the implementation of digital tools and practices across AAU. These efforts have been marked by close collaboration with internal partners.

Digitally Competent Management

In collaboration with the Master of ICT and Learning programme and PBL Digital, CDUL has led the development of a professional development programme tailored for programme management. The initiative was launched in autumn 2024 and will be offered biannually in 2025 and 2026.

Organisational Implementation of AAU Digital Essentials

CDUL leads the organisational implementation of AAU Digital Essentials (core systems that support the basic needs of students and educators across AAU study programmes) in close cooperation with PBL Digital and IT Services, ensuring alignment across units and supporting sustainable integration.

Support for AAU Digital Essentials

In close collaboration with AAU IT Services, CDUL contributes to the support and further development of AAU Digital Essentials. In 2024 and continuing into 2025, efforts are focused on strengthening the collaboration between first-line IT supporters and CDUL's consultants to improve the guidance available for AAU's teaching staff.

Digitally Competent Educators

CDUL leads this initiative in collaboration with PBL Digital and IAS PBL researchers. In 2024, efforts have focused on maturing the strategic action plan, which is expected to be implemented in 2025 through 2–3 professional development concepts offered to AAU teaching staff. This initiative supports the overall goal of enhancing digital teaching competencies.

Strategic Coordination of Continuing Education

Since 2024, CDUL has participated in a cross-institutional coordinating forum on continuing education, established under the AAU Knowledge for the World 2022–26 strategy. The forum supports the ongoing adaptation and development of AAU's continuing education activities.

PBL Knowledge Sharing – Den Digitale Agora

CDUL's focus areas include PBL knowledge sharing, primarily aimed at teaching staff at Aalborg University. CDUL produces a podcast entitled **Den Digitale Agora** as part of this initiative. Hosted by Associate Professor Jes Lynning Harfeld, each episode features a guest invited to engage in an inspiring conversation about their teaching experiences, aiming to explore diverse approaches for addressing challenges that may arise in education.

A total of three episodes were produced throughout 2024, addressing topics such as inclusion and exclusion in digitalised teaching, language technology and artificial intelligence.

New AI in Higher Education Network

Professor Euan Lindsay (UCPBL) has established a new AI in Higher Education network, which includes members from IAS PBL and across AAU. IAS PBL network members include Antonia Scholkmann, Stine Ejsing-Duun, Maria Hvid Stenalt, and Lasse Krejberg. The network aims to create a collaborative environment for exploring the intersection of AI and education, sharing insights, and collectively advancing our understanding through:

- Engaging in dynamic discussions and knowledge-sharing sessions
- Collaborating on research projects that explore innovative AI solutions to address challenges in higher education
- Networking with experts passionate about leveraging AI for positive change in higher education

During 2024, the network gathered once a month for informal lunch meetings.

IAS PBL Early Career Community

The IAS PBL Early Career Community continued in 2024 with a renewed format and broader participation. Originally established for PhD students, the network has been expanded to also include postdocs and research assistants affiliated with IAS PBL.

Driven by its members, the network organises meetings focused on topics relevant to early career researchers. In 2024, two meetings were held featuring internal speakers and discussions on themes such as early career mishaps and time management.

With the Early Career Community, IAS PBL aims to provide a valuable space for peer exchange, informal learning, and professional networking across career stages, strengthening both individual development and community within IAS PBL.

PhD Writing Retreat: Collaborative Research and Community Building

In 2024, IAS PBL hosted a writing retreat for PhD students, designed to strengthen research and writing skills through collaboration and peer support. The initiative brought together a small group of PhD students affiliated with IAS PBL for a year-long process, including a three-day retreat at Klitgaarden in Skagen, follow-up meetings, and shared writing activities.

The collaborative writing process is organised and facilitated by Associate Professor Patrik Kjærsdam Telléus (HEALTH-PBL) and offers a unique opportunity for the PhD students to work on a joint research publication. During the process, participants co-develop the topic, format, and methodology based on shared interests. Alongside academic development, the retreat nurtures a strong sense of community and professional networking across disciplines.

By combining focused writing time, peer feedback, and network-based learning, the retreat supports participants in developing both their scholarly identity and collaborative competencies.

The writing retreat process was kicked off in the autumn of 2024 and is expected to be concluded in late 2025.

Supporting Interdisciplinary Education

In June 2024, the university's Executive Board decided that the strategic *initiative Integration of SSH and STEM competences in AAU's degree programmes* will transition to operational support from 2025.

The decision reflects a need to prioritise resources in light of upcoming political and structural changes in the education sector and acknowledges that interdisciplinary efforts require dedicated support to succeed. The initiative focused on enhancing AAU students' ability to work across disciplinary boundaries, especially between SSH and STEM disciplines. IAS PBL will continue to contribute to this field both through research and support for interdisciplinary collaboration at AAU.

OUTREACH

During 2024, the Institute for Advanced Study in PBL welcomed visitors from all over the world, some of whom visited as part of a research collaboration with IAS PBL researchers, while others visited IAS PBL to learn more about PBL and the AAU PBL model by participating in our PBL workshop for visitors.

2024 included visits from countries such as the Netherlands (Maastricht, Twente, the Haagh), Poland, Germany, the UK, and India.

Visitors' Workshop

April and October 2024, Aalborg

Since its launch, IAS PBL has experienced strong interest from international researchers wishing to learn about Aalborg University's problem-based learning (PBL) model. In response, IAS PBL collaborated with UCPBL to develop a new interdisciplinary workshop format, building on UCPBL's long-standing experience. Researchers from all AAU faculties contributed to shaping the programme, which includes departmental visits and engagement with staff and students.

In 2024, IAS PBL hosted the third and fourth editions of the workshop, welcoming 14 and 18 participants in April and October, respectively. The two-day programme introduces participants to AAU's PBL principles, curriculum design, and assessment practices, followed by visits to departments to observe teaching and engage in dialogue with educators and students. The workshop is held twice annually and is designed to accommodate visitors from all academic disciplines.

Networked Learning Conference – Malta 2024

May 2024, Malta

The fourteenth International Networked Learning Conference (NLC2024) was hosted by the University of Malta and organised by the Networked Learning Conference Consortium in collaboration with the University of Malta. The conference brought together international scholars and practitioners to explore critical perspectives on digital education and networked learning.

Key themes included digital futures and environmental renaissance, AI and emerging technologies, ethical and responsible innovation, and spaces and modalities for networked learning. The programme featured keynote talks, paper presentations,

and discussions on learning across formal, non-formal, and informal contexts. NLC2024 contributed to advancing theoretical and practical understandings of networked learning in a time of rapid technological and societal change.

Director of IAS PBL, Professor Thomas Ryberg, is co-chair of the Networked Learning Conference Consortium.

The conference proceedings are available here: **Vol. 14 (2024): Networked Learning Conference 2024 proceedings.**

Digital Learning Day 2024
August 2024, Copenhagen

In collaboration with EdTech Denmark, Thorkild Hanghøj (KILD) organised Digital Learning Day, which was held on 13 August 2024 at the AAU Copenhagen campus. 180 researchers, practitioners, developers, and students took part in workshops and talks on Game-based learning, AI, Technology comprehension ('Teknologiforståelse'), and EdTech Startups.

Thorkild Hanghøj (KILD) and Erik Ottar Jensen (KILD) were among the presenters from AAU at Digital Learning Day 2024.

PBL Week 2024
November 2024, Aalborg

In celebration of Aalborg University's 50th anniversary, IAS PBL hosted a series of events under the heading PBL Week to highlight and celebrate 50 years of PBL pedagogy and research. The week featured a diverse programme of workshops and activities aimed at students, academic staff, and administrators.

Key events included the international ETALEE Conference, hosted by UCPBL, a visit from representatives of UCPBL's UNESCO advisory board, and a series of workshops on topics such as AI in the PBL environment, interdisciplinarity, PBL supervision, student wellbeing, and introducing first-year students to PBL.

The week served as a vibrant platform for knowledge sharing, collaboration, and celebration of AAU's unique educational model, and we are very grateful to those who attended the event.

ETALEE 2024 Exploring Teaching for Active Learning in Engineering Education Conference
November 2024, Aalborg

The ETALEE conference focused on two central themes: Artificial Intelligence (AI) and Interdisciplinarity. Organised by the IUPN network and hosted by UCPBL, the event brought together educators, researchers, and education managers to share knowledge and practices within engineering education.

The programme featured engaging keynote presentations, interactive workshops, and opportunities for networking and collaboration. The conference contributed to ongoing discussions about how active, student-centred learning can support the future of engineering education in a rapidly changing world.

Learn more about the ETALEE conference on the webpage www.etalee.dk

IAS PBL PHD PROJECTS

Collaboration, Leadership, and Sustainability in Higher Education: How Universities Operate and Align Sustainability in Education

This PhD project explores two aspects of higher education through the lens of sustainability: cross-institutional collaboration in engineering education contexts and middle-manager leadership in higher education. The project involves a systematic review, qualitative interviews, and current work on sustainability in student projects within a PBL environment. Findings suggest that while institutional strategies often face varied interpretations and resistance among staff, students—through mandatory project work—may offer a more direct and practice-oriented pathway for advancing sustainability in education. A future workshop with students will further explore this potential.

The project is led by PhD Fellow Svend Hauekrog Christiansen and supervised by Professor Xiangyun Du and Associate Professor Aida Guerra (UCPBL).

Digital Problem Based Learning for Facilitating the Acquisition of Collaborative Competencies

This mixed-method study will investigate the possibilities of *Digital Problem-Based Learning* within the medical education at AAU by exploring and testing digitally supported pedagogical design options for facilitating the acquisition of collaborative competencies.

The project is led by PhD Fellow Camilla Rams Rathleff (HEALTH-PBL) and supervised by Associate Professor Patrik Kjærsdam Telléus (HEALTH-PBL) and Professor and Director Thomas Ryberg. The project is funded by IAS PBL and the Department of Health Science and Technology.

En bedre start: Refleksive praksisfællesskaber for nyuddannede lærere gennem social virtual reality

A Better Start: Reflective Communities of Practice for Newly Graduated Teachers through Social Virtual Reality

The project aims to support the development of newly graduated teachers' professional judgment concerning classroom management through reflective communities of practice with more experienced colleagues.

The project focuses on designing and conceptualising digital learning spaces which utilise 360° video and Immersive Virtual Reality. The purpose of these spaces is to support collaborative reflection within teacher training. The project is funded by the Danish PhD Council for Educational Research.

The project is led by PhD fellow Lucas Paulsen (KILD) and supervised by Associate Professors Jacob Gorm Davidsen (KILD) and Susanne Dau (University College of Northern Denmark).

Tosprogede kvinders læring og deltagelse i SOSU-uddannelser: GenAI som kognitiv partner

Bilingual Women's Learning and Participation in SOSU Education: GenAI as a Cognitive Partner

The project is part of the larger research initiative, *2SOSU-AI: Generative AI in Vocational Education and Training: Strengthened Participation Opportunities for Bilingual Women in SOSU Education.* The PhD project focuses specifically on investigating how bilingual women use GenAI as a learning tool and how this affects their participation and learning in SOSU education. The project uses activity theory as a framework to in-

vestigate how GenAI can function as a mediating tool in learning processes. The research design is based on ethnographic approaches and qualitative action research. This includes participant observations of the women's daily school and training routines, as well as video recordings and interviews to collect detailed data on their learning practices and the barriers they face.

The project is led by PhD Fellow Amina Sabah Karim (SHARE-PBL) and supervised by Associate Professors Antonia Scholkmann (SHARE-PBL), Jin Hui Li and Assistant Professor Anne-Birgitte Rohwedder.

Interdisciplinary Teamwork in PBL

This PhD project focuses on interdisciplinarity and PBL, complexity and progression in team collaboration.

The project is led by PhD Fellow Maiken Winther (UCPBL) and supervised by Associate Professors Lykke Brogaard Bertel and Jette Egelund Holgaard (UCPBL).

Negotiating Teacher Identity amongst Early Career Academics: A Positioning Theory Perspective on Identity Construction in Professional Learning Communities

This PhD project explores how early career academics construct and negotiate their teacher identities through participation in a pedagogical development programme based on professional learning communities and peer interaction. Using Positioning Theory, the study analyses real-time peer group interactions to explore how ECAs position themselves and others, and how such dynamics shape emerging teacher identities. The project contributes to new insights into the processual construction of teacher identity and offers practical implications for strengthening pedagogical development and professional learning in higher education, thereby better supporting academics in delivering high-quality teaching.

The project is led by PhD fellow Karoline Ballieu Kjærgaard (SHARE-PBL) and supervised by Associate Professor Nikolaj Stegeager (SHARE-PBL) and Professor Xiangyun Du (UCPBL).

Proactive Career Development of Students in Technology and Engineering Education

This PhD project investigates how students in technology and engineering education proactively shape their careers through self-management and engagement. Addressing critiques of traditional, passive career research, the study applies Q methodology and narrative analysis to explore students' experiences in bridging education and early professional life. The project contributes to career studies in STEM by highlighting proactivity, identifying supportive pedagogical practices, and offering insights into career development in the post-pandemic context.

The project is led by PhD Fellow Anna Overgaard Markmann (UCPBL) and supervised by Professor Xiangyun Du and Associate Professor Bente Nørgaard (UCPBL).

Teacher Learning as a Complex Dynamic System in the Process of Implementing PBL in a South African K12 Context

Focusing on teacher learning in a context of implementing PBL in a South African K12 context (primary and secondary education) which is the subject of this research, is critical as South Africa introduces new approaches to learning and teaching.

The project is led by PhD Fellow Sizwe E. Nxasana (UCPBL) and supervised by Professor Xiangyun Du and Associate Professor Lykke Brogaard Bertel (UCPBL).

Technological Literacy in Science Education

This PhD project investigates how technological literacy can be meaningfully integrated into problem-based science education in Danish primary schools. In collaboration with in-service and teacher educators as well as pre-service teachers, the research explores how technology is understood in educational practice and how science teaching is designed and evaluated to support students' development of technological literacy.

The project is led by PhD Fellow Camilla Guldborg Hundahl (UCPBL) and supervised by Associate Professors Lykke Brogaard Bertel and Stine Ejsing-Duun (UCPBL), Martin Sillasen from VIA University College and Maria Møller from University College of Northern Denmark. The PhD project is funded by CESE/NAFA.

2024 PHD GRADUATES

Engineering Students' Perspectives on the Learner Agency Development in an Intercultural PBL Context in Denmark

This PhD project explores how engineering students develop learner agency within an intercultural problem- and project-based learning (PBL) environment. Through a systematic review, narrative inquiry, and survey analysis, the study identifies key characteristics, challenges, and supportive elements of intercultural collaboration. Findings show that students shift from passive adaptation to active contribution, highlighting motivation, teamwork, and contextual factors as central to fostering learner agency. The research offers insights and recommendations for students, educators, and institutions aiming to enhance intercultural learning in engineering education.

The project was led by PhD Fellow Dan Jiang (UCPBL) and supervised by Associate Professor Bettina Dahl Søndergaard, Professor Xiangyun Du (UCPBL) and Associate Professor Pia Bøgelund. The project was concluded in 2024, and the thesis is available **here.**

Self-Directed Learning in Problem-and Project-Based Learning: A Study of Self-Direction in the Aalborg PBL Model

This PhD project examines how self-directed learning (SDL) develops among students in Aalborg University's PBL environment. Using both quantitative and qualitative methods, the research validates a measurement tool (OCLI), tracks SDL progression across student cohorts, and explores how students negotiate collaborative practices. The findings support that students become more self-directed over time and that AAU's PBL model effectively facilitates this development.

The project was led by Nicolaj Riise Clausen (UCPBL) and supervised by Anette Kolmos and Claus D. Hansen. The project was concluded in 2024, and the thesis is available **here**.

PHD COURSES

Study Circle on PBL Research in Education – from Design to Publication

In 2024, a new initiative was launched to support the development of early-career researchers within UCPBL and IAS PBL. Led by Professor Xiangyun Du (UCPBL), the PhD Study Circle on PBL Research in Education – from Design to Publication offers a focused learning environment for PhD students working with problem-based learning (PBL).

The study circle spans 6-8 months and includes six sessions where participants engage in peer review, writing exercises, experience sharing, and feedback from senior researchers and supervisors. The initiative provides a valuable supplement to existing PhD courses by offering a more targeted focus on PBL research design, theory, methodology, data analysis, and academic writing.

Applying the Danish Code of Conduct

Organisers and lecturers include Associate Professors Trine Fink and Antonia Scholkmann

This course examines the Danish Code of Conduct for Research Integrity that guides the research practices of scientists, researchers, and their collaborators. The course introduces the principles of research integrity, dwells on the basic standards for conducting responsible research and introduces the current administration for misconduct.

In 2024, a total of five courses were completed.

Learn How Creative Thinking Can Transform Your Research

Organised by Associate Professor Søren Hansen

The course offers a deep understanding of creative thinking in research and aims to enable PhD students to make room for creative thinking and methodology in their research. The systematic use of creative thinking can be particularly helpful in generating new ideas, hypotheses, experimental designs, and data interpretation as well as in the communication of research.

Mixed Methods

Organised and taught by Professor Xiangyun Du. Lecturers include Associate Professor Aida Guerra and Assistant Professor Juebei Chen

The course intends to support participants in developing interdisciplinary inquiry skills by analysing the needs for mixed-method research and designing mixed-method research using diverse strategies. A problem and project-based learning approach is adopted in this course, involving participants working in groups on real-life issues identified on their own.

PBL and Facilitations Skills

Organised and taught by Professor Xiangyun Du and Associate Professor Aida Guerra. Taught by Assistant Professor Juebei Chen

This PhD course aims to help students understand and reflect on Aalborg University's systemic PBL approach. Participants will learn about the Aalborg PBL model, collaborative project work, and how to facilitate and manage various projects and problems.

Professional Communication

Organised by Professor Euan Lindsay

Taking both a theoretical and practical approach, the course aims to help PhD students become aware of the many dimensions of effective communication and to develop their competencies to prepare them for communicating in a professional research context.

In 2024, a total of two courses were completed.

Project Management and Interpersonal Skills

Lecturers include Henrik Worm Routhe

This practical workshop helps PhD students manage their projects by focusing on both project management skills in a creative, unstructured university environment as well as interpersonal skills, especially in cooperation with supervisors and stakeholders.

In 2024, a total of two courses were completed.

Qualitative Research within Health Science

Organised by Associate Professor Henrik Vardinghus-Nielsen

This course provides participants with the basic competences for designing a qualitative study and experiences with the benefits and limitations of using qualitative methods within the health sciences. The course specifically focuses on designing a study, selecting appropriate methods, collecting data, and finally analysing the data.

Teaching with Problem-Based Medical Cases: Theoretical and Practical Foundation for Case Facilitators

Lecturers include Associate Professors Patrik Kristoffer Kjærsdam Telléus and Trine Fink

This course provides a solid introduction to the theoretical and practical foundation of case facilitation with problem-based learning (PBL). A special focus is on the role of the case facilitator, and the practicalities of case facilitation, down to the level of what to bring to a session and other experiences.

Understanding Theory of Science

Organised by Associate Professor Patrik Kristoffer Kjærsdam Telléus

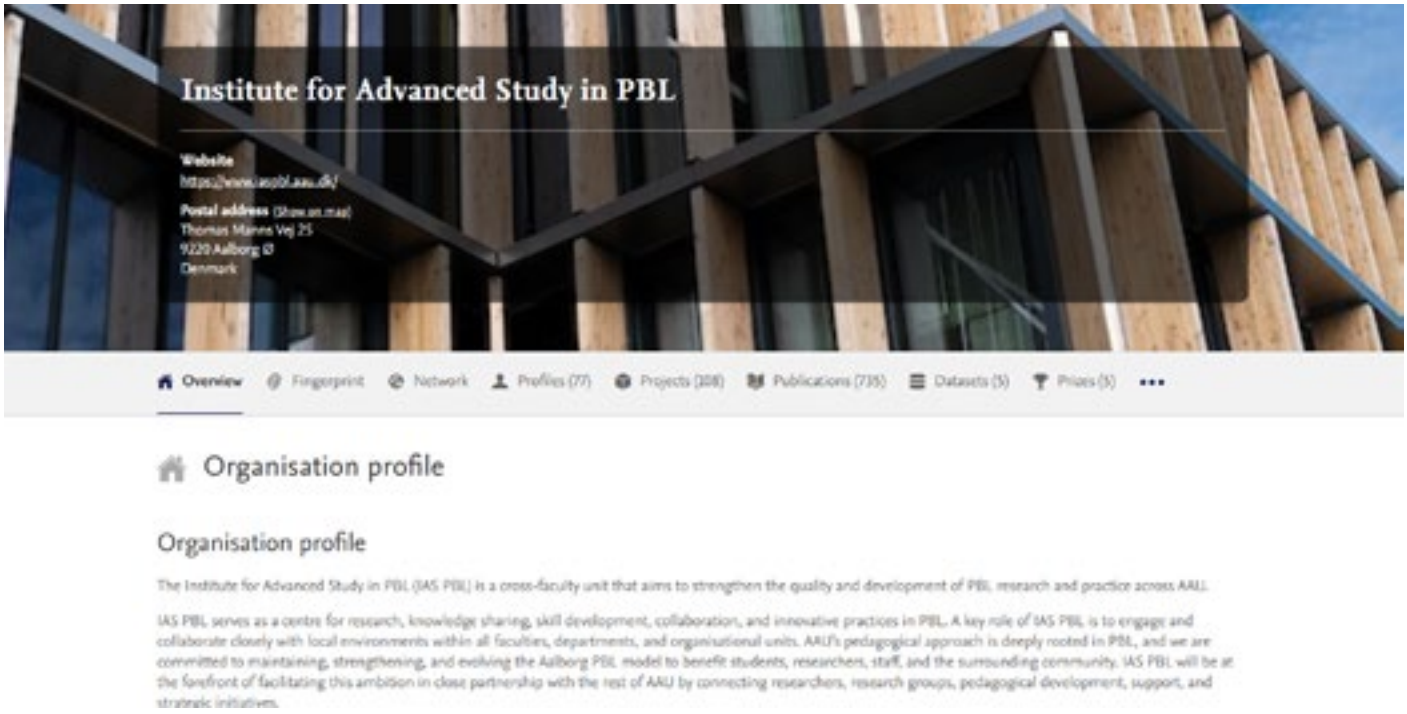
The course provides participants with the opportunity to practice the art of the theory of science, to better acquaint themselves with the field, and learn how to apply its thoughts and positions. The course focuses on current problems in the theory of science that are relevant for research within the health sciences and the technological and natural sciences.

IAS PBL DISSEMINATION

Researchers affiliated with the Institute for Advanced Study in PBL continuously publish research on problem-based learning within all AAU disciplines. A full list of publications of research outcomes and projects is available on our **Research Profile.**

For more information on the Institute for Advanced Study in PBL, please visit our website or our LinkedIn company page:

iaspbl.aau.dk
linkedin.com/company/ias-pbl



PUBLICATIONS 2024

The following is a list of publications, including journal articles, conference articles, review articles, editorials, books, anthologies, book chapters, conference articles and abstracts, papers, reports and net publications, published in 2024 by IAS PBL staff.

Abou-Hayt, I., & Dahl, B. (2024). **A Critical Look at the Laplace Transform Method in Engineering Education.** *I E E E Transactions on Education, 67*(4), 542-549.

Andersson, V., & Balslev, H. (2024). **Building Employability Skills for Graduate Students.** In M. Cutajar, C. Borg, M. De Laat, M. B. Dohn, & T. Ryberg (Eds.), *Proceedings of the Fourteenth International Conference on Networked Learning 2024* (pp. 1-2). Aalborg University Open Publishing.

Baligar, P., Amashi, R., Vijayalakshmi, M., Chen, J., Guerra, A., & Du, X. (2024). **Review on empathy in engineering education: Conceptions, interventions, and challenges.** In P. Baligar, K. Mallibhat, R. Kandakatla, & R. Amashi (Eds.), *10th Research in Engineering Education Symposium: Connecting Research-Policy-Practice for Transforming Engineering Education, REES 2024* (Vol. 1, pp. 90-99). Research in Engineering Education Network.

Bernhard, J., van den Bogaard, M., Broadbent, R., Chance, S., Daniel, S., Direito, I., Du, X., Edström, K., Knight, D., Male, S., May, D., Mitchell, J. E., & Wint, N. (2024). **ENGINEERING EDUCATION RESEARCH: WRITING FOR PUBLICATION**. In J. D. Zufferey, G. Langie, R. Tormey, & B. V. Nagy (Eds.), *SEFI 2024 - 52nd Annual Conference of the European Society for Engineering, Proceedings: Educating Responsible Engineers* (pp. 2444-2448). Société européenne pour la formation des ingénieurs (SEFI).

Boelt, A. M. (2024). **A Personal Introduction to Knud Illeris' Problemorientering og Deltagerstyring: Oplæg til en Alternativ Didaktik**. *Journal of Problem Based Learning in Higher Education, 12*(2), 34-41.

Brooks, E., Dau, S., Bertel, L. B., Granone, F., Edstrand, E., & Reikerås, E. K. L. (2024). **Towards Computational Play: Designing Open-Ended Play-Responsive Environments Supporting Computational Thinking in Early Childhood Education and Care**. In E. Brooks, A. Kalsgaard Møller, & E. Edstrand (Eds.), *Design, Learning, and Innovation: 8th EAI International Conference, DLI 2023, Aalborg, Denmark, November 6-7, 2023, Proceedings* (pp. 144-154). Springer.

Buhl, M., Dille, M. H. B., Hautopp, H., & Tervo, J. (2024). **Exploring Hybrid Learning Formats in a Nordic Master's Programme in Visual Studies and Art Education**. In M. Cutajar, C. Borg, M. De Laat, N. B. Dohn, & T. Ryberg (Eds.), *Proceedings of the Fourteenth International Conference on Networked Learning 2024* Aalborg University Open Publishing.

Buhl, M., & Skov, K. (2024). From 'tool' to 'collaborator': Digital 3D modelling as a catalyst for new aesthetic practices: A study of student teachers' education in visual arts. In M. Buhl, & T. Haïkïo (Eds.), *3D Digital Modelling in Visual Arts Education* (Vol. 20, pp. 51-73). Article 4 Umeå University.

Buhl, M. (2024). **I argue: Visuals play a crucial role in digital learning.** *European lifelong learning magazine.*

Caratozzolo, P., Smith, C. J. M., Gomez, S., Moris, M. U., Nørgaard, B., Heiß, H. U., & Azofeifa, J. D. (2024). **A novel taxonomy for facilitating in-depth comparison of continuing engineering education practices.** *Frontiers in Education, 9,* Article 1444595.

Caratozzolo, P., Smith, C. J. M., Gomez, S., Urenda Moris, M., Nørgaard, B., Heiß, H.-U., Schrey-Niemenmaa, K., & Hadzilacos, R. (2024). A Novel Taxonomy for Continuing Engineering Education. In *Proceedings of 19th World Conference on Continuing Engineering Education* (pp. 17-20). IACEE.

Caratozzolo, P., Cukierman, U., Nørgaard, B., Schrey-Niemenmaa, K., Azofeifa, J. D., & Rueda-Castro, V. (2024). **Future Skills Forecasting: Ensuring Quality Learning for Every Segment of the Workforce.** In *EDUCON 2024 - IEEE Global Engineering Education Conference, Proceedings* (pp. 1-5). Article 10578916 IEEE (Institute of Electrical and Electronics Engineers).

Chen, J., Du, X., Guerra, A., Silva, F. M. F. D., & Chaaban, Y. (2024). **Sources Contributing to Engineering Students' Academic Well-Being: An exploration using the Q methodology.** *Journal of Engineering Education, 113*(3), 576-602.

Chen, J., Du, X., Jiang, D., Guerra, A. O. P. D. C., & Nørgaard, B. (2024). **A review study with a systematic approach: Pedagogical development for educators in higher engineering education.** *European Journal of Engineering Education,* 49(2), 299-329.

Christiansen, S. H., Du, X., & Guerra, A. O. P. D. C. (2024). **Middle Management Leadership Experiences of a Mission-Driven Innovation University Strategy**. *Education Sciences, 14*(6), Article 609.

Chaaban, Y., Tarlochan, F., Chen, J., & Du, X. (2024). **Exploring sources of engineering students' academic well-being through Q-methodology research.** *Teaching in Higher Education.* Advance online publication.

Chaaban, Y., Al-Thani, H., & Du, X. (2024). **A systems-thinking approach to evaluating a university professional development programme.** *Professional Development in Education, 50*(2), 296-314.

Chaaban, Y., Qadhi, S., Chen, J., & Du, X. (2024). **Understanding Researchers' AI Readiness in a Higher Education Context: Q Methodology Research.** *Education Sciences, 14*(7), Article 709.

Chaaban, Y., Qadhi, S. M., & Du, X. (2024). **Exploring intrinsic and extrinsic sources of academic well-being among university teachers through Q methodology research.** *Journal of Applied Research in Higher Education.* Advance online publication.

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