



**ERL 2024**

The 4<sup>th</sup> International Symposium  
on Educational Research

Education and Digital Transformation:  
Thriving in a VUCA World

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## The ERL2024 International Symposium's Report

The Educational Research Lab (ERL) held its 4<sup>th</sup> International Symposium on Educational Research (ERL2024) on Monday, October 7, 2024. The symposium included 5 plenary speeches, 6 workshops, 17 papers, and 9 poster presentations. The talks covered various fields of research, including but not limited to educational adaptation and sustainability, digital transformation and global trends in e-learning, learner's retention and engagement, Integration of Artificial Intelligence (AI), assessment validity and reliability in today's teaching and learning landscape, curriculum and material design for today's learner, inclusiveness and equity.

### The ERL2024's International Symposium Platform:



Since the theme revolved around *Education and Digital Transformation: Thriving in a V.U.C.A. World*, the ERL2024 International Symposium offered its audience a virtual reality experience through its digital platform (exhibition hall). The attendees could navigate from one

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hall to another to attend concurrent sessions or workshops and look for ERL job opportunities. For more information, please contact: [erl@psu.edu.sa](mailto:erl@psu.edu.sa).

### The Opening Ceremony:

The opening ceremony of the 4<sup>th</sup> International Symposium on Educational Research was initiated by **Dr. Heba Khoshaim**, Prince Sultan University's Vice President of the female campus, on behalf of Prince Sultan University's President and Honorary Chair of the ERL2024, **Dr. Ahmed Al-Yamani**. In her welcoming speech, Dr. Heba Khoshaim started by emphasizing the positive aspects of the current status of the "public health" and the "economic outlook." She then stressed PSU's role in practicing agility and resilience in pursuit of better education through adopting innovative technologies, creating new learning opportunities, and producing scientific research. Furthermore, Dr. Khoshaim highlighted PSU's role as a "pioneering institution that breaks new grounds in education" and holds the distinction of being the first non-profit private university in the Kingdom of Saudi Arabia, KSA. She concluded her speech by highlighting that the university is now in its third Strategic Plan's fifth and final year. The goal is to continue its successful journey towards becoming a 'model of excellence in private higher education' and expanding access to new learning opportunities. Additionally, PSU is ready to launch its 4<sup>th</sup> Strategic Plan with a "large emphasis on scientific research." In closing, Dr. Khoshaim thanked and expressed appreciation to all ERL2024 International Symposium organizers, participants, and attendees.

The opening ceremony was concluded by the remarks of **Dr. Norah Almusharraf**, the Leader of the Educational Research Lab and the Conference Co-chair, who extended a warm welcome to all organizers, presenters, and attendees at the 4<sup>th</sup> International Symposium on Educational Research (ERL2024). She commenced her welcoming address by emphasizing PSU's role as a leading Saudi university in promoting educational excellence and refinement. Furthermore, Dr. Almusharraf elaborated on PSU's commitment to conducting cutting-edge scientific research as a means to elevate PSU to the highest level of quality in higher education. Continuing, Dr. Almusharraf emphasized the mission of the Educational Research Lab (ERL), which aims to 'bridge the realms of education research and practice with a commitment to

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fostering an evidence-based education system.' The lab also seeks to facilitate collaborations with researchers, educators, and policymakers to enhance academic outcomes and strengthen the foundation of the educational systems. In her concluding statement, she expressed gratitude to the lab team for their instrumental role in organizing this significant event.

**The ERL2024 program included five plenary talks by distinguished scholars (figure 1):**

**Table 1:**

Name	Affiliation	Topic
<b>Prof. Birgit Phillips</b>	FH JOANNEUM University of Applied Sciences, Austria	<b>AI and the new academic frontier: Shaping future competencies for a digital world</b>
<b>Dr. Hamish Chalmers</b>	University of Oxford, UK	<b>Methodological and reporting rigor of systematic reviews and meta-analyses in language education: Findings from the international database of education systematic reviews</b>
<b>Prof. Sami Alsenaidi</b>	Qassim University, KSA	<b>Rethinking the use of educational research in confronting educational challenges in the world of VUCA</b>
<b>Prof. Mohamed Bououdina</b>	Prince Sultan University, KSA	<b>AI in STEM education: Trends, challenges, and DE and I (diversity, equity, and inclusion)</b>
<b>Prof. Anis Koubaa</b>	Prince Sultan University, KSA	<b>Leveraging generative AI in education- opportunities and challenges</b>

**Figure 1: Keynote Speakers of the ERL2024**



### Plenary Sessions:

The first plenary session in the 4<sup>th</sup> International Symposium on Educational Research was delivered by **Prof. Birgit Phillips** from FH JOANNEUM University of Applied Sciences in Austria on AI and the New Academic Frontier: Shaping Future Competencies for a Digital World. Her comprehensive session covered the impact of AI on the educational landscape, the competencies required for future success, and the necessary shifts in both teaching and assessment strategies to meet the demands of the digital era.

Prof. Phillips addressed shifting from a VUCA (Volatility, Uncertainty, Complexity, Ambiguity) to a BANI (Brittle, Anxious, Nonlinear, Incomprehensible) world. This shift necessitates a new way of thinking about education and competencies, moving beyond traditional skills to those critical in the AI age. She discussed the evolution of competencies across the various industrial revolutions, illustrating how literacy in AI, systems thinking, and future literacy have become pivotal in the 4th Industrial Revolution. As AI integrates more deeply into everyday life, education systems need to prepare learners with analytical and strategic thinking skills, empathy, resilience, and normative competence.



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A core element of Prof. Phillips' presentation was the exponential growth of data and the challenges it presents for information processing and evaluation. She highlighted the staggering increase in data generation—growing from 5 exabytes by 2003 to similar amounts being produced in mere minutes today. This exponential data rise exemplifies AI's transformative effect across sectors, especially in education, where AI-generated content like music and writing has surged, posing challenges for original creators to stand out.

She also delved into the "superhuman" capabilities of AI systems, emphasizing their advanced skills in communication, emotional competence, creativity, and analytical abilities. For example, AI-driven systems have demonstrated superior performance in medical diagnostics, outstripping general practitioners in various competencies. Additionally, AI agents can autonomously perform tasks that range from coding to complex decision-making, further underscoring the need for educational systems to integrate AI literacy and adaptability into curricula.

Prof. Phillips stressed the importance of reassessing traditional education models, especially around examination and assessment culture. She noted that current grading systems often reduce intrinsic motivation, reinforce inequalities, and encourage cheating. She advocated for a shift towards process-oriented, competency-based, and blended assessment approaches, which better reflect the holistic and dynamic skills needed in the AI-driven world. Furthermore, she introduced the concept of "ungrading," emphasizing qualitative feedback over quantitative scores to promote self-directed learning and long-term skill development.

Lastly, she highlighted the need for teacher professional development and institutional policy changes to align with modern educational needs. This includes fostering AI and digital literacy among educators and encouraging interdisciplinary teaching approaches to support a more integrated and learner-centered educational experience. Overall, Prof. Phillips' keynote was a call to action for educators, policymakers, and institutions to rethink education in the context of the digital and AI-driven world. Her insights underscored the urgency of equipping students with the future competencies required for success in an AI-dominated era while also promoting ethical considerations and transformative learning approaches in education.



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In the second plenary session, **Dr. Hamish Chalmers**, a Senior Lecturer at the University of Oxford, emphasized the significance of systematic reviews in educational research. He explained how systematic reviews are crucial for synthesizing evidence and providing a comprehensive understanding of language learning and education interventions. Dr. Chalmers highlighted the challenges researchers face, such as the presence of biased or inconsistent data, and how systematic reviews help mitigate these issues by offering a transparent and replicable research methodology.

A key point of the session was the role of the International Database of Education Systematic Reviews (IDESR), which Dr. Chalmers has been actively involved in. This initiative seeks to provide a centralized platform for researchers and educators to access high-quality systematic reviews, enhancing the reliability and credibility of educational research findings. He explained that systematic reviews are particularly valuable in language education, where diverse approaches and varying pedagogical practices can make it difficult to draw definitive conclusions from isolated studies. Dr. Chalmers also discussed the importance of rigorous methodological standards in conducting systematic reviews. He outlined best practices for ensuring that these reviews are robust, including the need for clear research questions, comprehensive literature searches, and careful appraisal of study quality. He stressed that these steps are critical for reducing bias and ensuring that conclusions are based on a balanced and thorough examination of the evidence.

Moreover, he pointed out that systematic reviews can serve as a valuable resource for policymakers and practitioners in education. By consolidating findings from multiple studies, these reviews provide a strong evidence base for decision-making and curriculum design, particularly in language education. Dr. Chalmers encouraged researchers to contribute to the growing body of systematic reviews, as this would help build a more solid foundation for future educational interventions and policies. Dr. Chalmers concluded his plenary session by offering a detailed overview of the value and application of systematic reviews in language education research. His insights underscored the need for careful, methodologically sound approaches to research synthesis, and he advocated for the continued development of platforms like IDESR to facilitate access to reliable and comprehensive educational research.

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The third plenary session of the ERL 2024 conference, titled Rethinking the Use of Educational Research to Address Challenges in the VUCA World, was presented by **Prof. Sami Alsenaidi** from Qassim University, KSA. During the symposium, Prof. Alsenaidi delivered an insightful presentation on the theme "Rethinking the Use of Educational Research to Address Challenges in the VUCA World." He began by explaining how the rapid changes in technology, society, and culture have drastically altered the landscape of education in the 21st century. This transformation has led to a world defined by volatility, uncertainty, complexity, and ambiguity (VUCA), significantly impacting educational research. Dr. Sami argued that conventional research methods, which are often rigid and linear, are inadequate in a VUCA world where change is constant and unpredictable.

To navigate these challenges, Prof. Alsenaidi proposed a shift toward more agile and adaptive research methodologies. He underscored the importance of interdisciplinary approaches, where knowledge from various fields can come together to provide more comprehensive insights. Additionally, he stressed the need to leverage technological advancements, such as big data and artificial intelligence, to keep pace with the fast-evolving educational landscape.

Prof. Alsenaidi also discussed the critical role of collaboration between researchers, educators, and policymakers in tackling the complexities of modern education. He pointed out that addressing VUCA challenges requires a collective effort and a willingness to experiment with new research paradigms. His presentation concluded with practical recommendations, urging the research community to embrace innovation and rethink their approaches to ensure educational research remains relevant and impactful in today's volatile world.

The fourth plenary session of the ERL 2024 conference, titled AI in STEM Education: Trends, Challenges, and DEI (Diversity, Equity, and Inclusion), featured a keynote presentation by **Prof. Mohamed Bououdina** from Prince Sultan University, KSA. His address explored the evolving role of artificial intelligence in STEM education, highlighting both its transformative potential and the challenges it presents, particularly in relation to diversity, equity, and inclusion (DEI).



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Prof. Bououdina began by discussing the significant trends in AI integration within STEM education. He pointed out that AI technologies are revolutionizing how students engage with STEM subjects, offering more personalized learning experiences, automating routine tasks, and enabling more sophisticated problem-solving techniques. AI-driven tools like virtual labs, intelligent tutoring systems, and data analytics platforms reshape how educational content is delivered and assessed. These advancements allow for more interactive and adaptive learning environments, making STEM education more accessible and engaging for students from diverse backgrounds.

However, Prof. Bououdina also emphasized the challenges accompanying AI's growing role in education. One of the key concerns he raised was the potential for AI to reinforce existing inequalities if not implemented with careful consideration of DEI principles. While AI can democratize access to high-quality STEM education by making resources available to a broader audience, it can also exacerbate disparities if certain groups are left behind in the digital transformation. Prof. Bououdina stressed the importance of ensuring that AI tools are designed and deployed in inclusive and equitable ways, catering to the needs of underrepresented groups, including women, minorities, and economically disadvantaged students. The session delved deeply into the intersection of AI and DEI in STEM education. Prof. Bououdina highlighted that, although AI offers opportunities to enhance learning for all students, research is still needed to understand its long-term effects on educational equity. He called for more studies examining the impact of AI-based interventions on diverse student populations, particularly focusing on how these tools can be tailored to address the unique challenges marginalized groups face. The ethical considerations surrounding data privacy, algorithmic bias, and unequal access to technology were central themes in his presentation. He emphasized the need for policies that ensure fairness and accountability in using AI systems in education.

A significant portion of the keynote addressed the role of AI in fostering interdisciplinary collaboration within STEM education. Prof. Bououdina argued that AI supports subject-specific learning and encourages a more integrated approach to problem-solving. By bridging the gaps between disciplines such as mathematics, computer science, engineering, and the natural sciences, AI enables students to develop a more comprehensive understanding of complex global





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challenges. This interdisciplinary focus, combined with AI's ability to personalize learning, can help prepare students for the demands of a rapidly evolving workforce.

In relation to diversity, equity, and inclusion, Prof. Bououdina underscored the critical need for intentional efforts to promote diversity within AI-driven STEM education. He advocated for targeted strategies that address the barriers faced by underrepresented groups, such as improving access to AI tools and resources in underserved communities, providing mentorship opportunities, and creating inclusive curricula that reflect diverse perspectives. He stressed that the success of AI in STEM education will ultimately depend on how well these technologies can be leveraged to support equity and inclusion at all levels of learning. In concluding remarks of this session, Prof. Bououdina provided a comprehensive overview of the current trends and challenges in integrating AI into STEM education, particularly focusing on the importance of DEI. His insights underscored the dual role of AI as both a powerful tool for enhancing educational outcomes and a potential source of new challenges if equity issues are not adequately addressed. The session called for continued research, interdisciplinary collaboration, and policy reforms to ensure that AI's transformative potential in STEM education is realized in ways that promote diversity, equity, and inclusion.

In this symposium's fifth and final plenary session, **Prof. Anis Koubaa**, from Prince Sultan University, delivered a comprehensive talk on Leveraging Generative AI in Education: Opportunities and Challenges. His presentation addressed the transformative impact of generative AI on education, highlighting both the potential and challenges of integrating AI tools like ChatGPT into educational systems.

Prof. Koubaa started by outlining the rapid adoption of AI technologies, noting that 99.4% of 509 U.S. higher education institutions consider AI essential for competitiveness within the next three years. He emphasized that generative AI, such as ChatGPT, has already begun to revolutionize how educational institutions handle teaching, assessments, and learning outcomes by enabling machines to generate human-like content—whether text, images, or sounds—AI opens vast opportunities for innovation in personalized learning, grading automation, and content creation. The application of AI extends across various academic tasks, such as automating



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grading and generating tailored feedback for students, reducing the workload of educators while improving feedback efficiency.

A core element of the presentation was the dual role AI plays in education: both as an opportunity and a challenge. Prof. Koubaa highlighted how AI tools are increasingly being used to personalize educational experiences by analyzing students' performance data and providing real-time feedback tailored to individual learning needs. These AI-driven systems can continuously adapt to learners, offering dynamic support and fostering a more inclusive learning environment. However, he also addressed the significant concerns surrounding the ethical use of AI in education. Key risks include data privacy, the potential for AI-generated content to spread misinformation, and the possibility of students becoming overly dependent on AI tools, which could weaken critical thinking skills. Additionally, he raised concerns about biases in AI algorithms, which might inadvertently reinforce inequalities in education.

In the area of assessments, Prof. Koubaa introduced the concept of *ExamGPT*, an AI-based system designed to automate the grading of exams. This technology offers numerous advantages, such as providing timely and unbiased feedback, reducing the time educators spend grading, and ensuring consistency in evaluation standards. He also pointed out that AI's ability to handle handwritten exams and provide instant feedback could transform the traditional examination culture. Nonetheless, he urged caution in over-relying on these systems, advocating for a balanced approach where AI supports but does not entirely replace human judgment. Prof. Koubaa concluded his session by emphasizing the need for clear ethical guidelines and data security measures in AI-driven education systems. He called on educational institutions to invest in training educators on the ethical use of AI and to prioritize transparency in how AI tools are integrated into teaching and assessment processes. As generative AI continues to evolve, its impact on education will depend on striking the right balance between harnessing its potential and mitigating the associated risks.

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The ERL2024 program also included six training workshops, which were as follows:

Name	Affiliation	Topic
<b>Dr. Daniel Bailey</b>	Austin Peay State University, USA	<b>Exploring Grammarly's impact on writing confidence and help-seeking behavior in higher education</b>
<b>Dr. Andrea Lee</b>	Austin Peay State University, USA	<b>Fostering collaboration-engaging with STAR scholars network for transformative impact</b>
<b>Mr. Zaid Al-Dawood</b>	King Abdulaziz Center For Cultural Communication, KSA	<b>The role of partnerships in enhancing communication and achieving sustainable development goals</b>
<b>Mr. Mohammad Al-Qahtani</b>	TETCO, KSA	<b>Innovative applications in educational technologies in the Kingdom of Saudi Arabia</b>
<b>Ms. Fatimah Jelaidan</b>	Innovation Center, KSA	<b>The innovation center's programs, services, and our global and local educational solutions utilizing emerging technologies</b>
<b>Ms. Aljawhara AlHarbi</b>	King Saud University, KSA	<b>Shadow and shade-word choice in literary translation</b>



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## Regional Analysis of the ERL2024:



### Region/ Country

We had attendees from different parts of the world:

- 50 % are from the Gulf region, including Saudi Arabia, the United Arab Emirates, Yamen, and Oman.
- 20% of Middle Eastern countries, including Egypt and Jordan.
- 10% of African countries, like Morocco and South Africa.
- The other 20% came from the United States, Canada, the UK, Japan, South Korea, the Philippines, India, and Pakistan.



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**Frequency of keyword clusters in IDESR**

**Importance of Scale**

**Current Trends in STEM Education**

Interdisciplinary Teaching, Technological Advancements, Digital Platforms, Gamification

**CHATGPT: DISRUPT INDUSTRIES**

• Chegg  
• Provides homework help and textbook re  
• American education technology compa  
• ChatGPT online free video  
• EdTech Chegg stock drops 50%  
• CEO admits ChatGPT making business obsolete  
• Students increasingly turn to ChatGPT for learn  
• Net income down 92% YoY  
• Net profit margin collapses 92% YoY  
• Earnings Before Interest, Taxes, Depreciation, or  
• Generative AI disrupting industries

**Simplifying the process of finding relevant Systematic Reviews**

IDE SR International Database of Education Systematic Reviews

**Analysis of Research Trends Using VOSviewer**

5. Results

**Analysis of Student Performance in CS102 - Section 780 Fall 2023**

The 4<sup>th</sup> International Symposium on Educational Research (ERL2024) conducted a survey (ERL2024 Survey) for all registered attendees:

Survey	Responses (percentage)
What is the best way education can transform digitally to meet with the demands and needs of the current VUCA world?	The responses of the <b>1350</b> attendees varied but mostly were about: - Project-Based Learning and





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	<p>Real-World Problem Solving (Digital Collaboration Tools, Simulations and Virtual Labs)</p> <ul style="list-style-type: none"> <li>- Development of Digital Literacy and Lifelong Learning (Continuous Skill Development Platforms Emphasizing Digital Literacy)</li> <li>- Flexible Learning Models</li> <li>- Emphasizing Critical Thinking and Decision-Making Skills (AI-Driven Case Studies and Scenarios, Virtual Reality (VR) and Augmented Reality (AR))</li> </ul>
<p><b>What are the ERL2024 International Symposium's strands?</b></p> <ol style="list-style-type: none"> <li>1. Educational adaptation and sustainability</li> <li>2. Digital transformation and global trends in e-learning</li> <li>3. Learner's retention and engagement</li> <li>4. Assessment validity and reliability in today's teaching and learning landscape</li> <li>5. Curriculum and material design for today's learner</li> <li>6. Inclusiveness and equity</li> <li>7. All of the above</li> </ol>	<p>Of 1350 attendees:</p> <ul style="list-style-type: none"> <li>- 74.6% replied all of the above.</li> <li>- 14.4% replied no. 2</li> <li>- 7.6% replied no. 1</li> <li>- 1.4% replied no. 5</li> <li>- 1% replied no. 4</li> <li>- 0.7% replied no. 6</li> <li>- 0.3% replied no. 3</li> </ul>
<p><b>Which of the following activities do you expect from the Educational Research Lab (ERL) at Prince Sultan University?</b></p> <ol style="list-style-type: none"> <li>1. International symposiums</li> <li>2. Research seminars</li> <li>3. Training courses/workshops</li> <li>4. Students' involvement</li> <li>5. National and international collaborations</li> <li>6. Job opportunities (Postdoc and Senior researchers)</li> <li>7. All of the above</li> </ol>	<p>Of 1350 attendees:</p> <ul style="list-style-type: none"> <li>- 69.2% replied no. 7</li> <li>- 11.1% replied no. 1</li> <li>- 10.7% replied no. 2</li> <li>- 4.5% replied no. 4</li> <li>- 2% replied no. 5</li> <li>- 1.5% replied no. 3</li> <li>- 1% replied no. 6</li> </ul>



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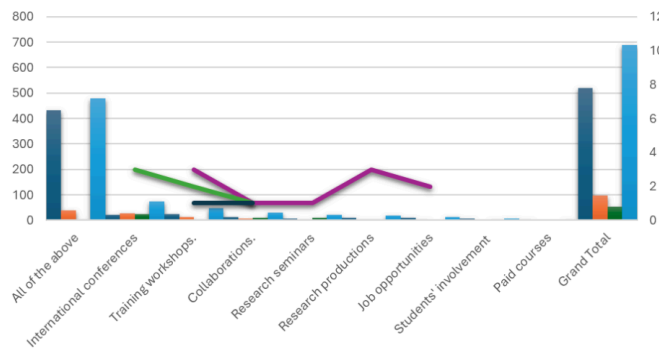
**On a scale of 1-5 (with 5 being the highest), how would you rate the quality of interaction of this current event?**

Of **1350** attendees:

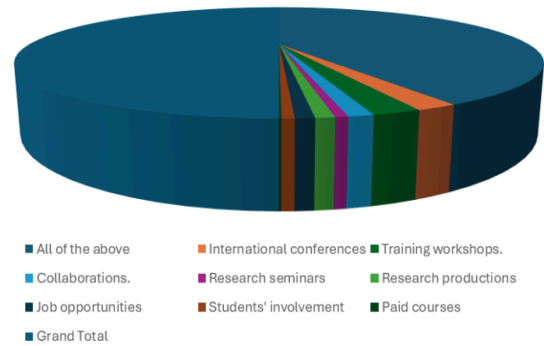
- 76.5% replied on a scale of 5
- 18% replied on a scale of 4
- 4.1% replied on a scale of 3
- 0.8% replied on a scale of 2
- 0.6% replied on a scale of 1

### Summary of ERL2024 Attendees' Responses:

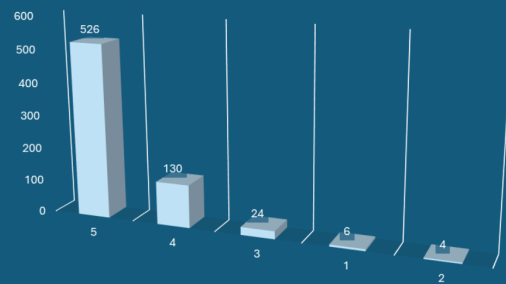
**Which of the following activities do you expect from the Educational Research Lab (ERL) at PSU?'**



What are the ERL2024 International Symposium's strands?  
All of the above.



**Accounts for the majority of 'on a scale of 1-5- how would you rate the quality of interaction of this current event?'**





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### **Future Plans:**

The Educational Research Lab (ERL) will hold its **5<sup>th</sup> International Conference Series on Educational Research (ERL2025)** in **October 2025**. Kindly follow our digital platforms to stay tuned to our Annual International Symposium Series' announcements.

- **Official website:** <https://www.psu.edu.sa/en/CHS/ERL>
- **X:** [https://twitter.com/erl\\_psu](https://twitter.com/erl_psu)
- **LinkedIn:** <https://www.linkedin.com/in/the-educational-research-lab-erl-008283214/>