

Skills and Competencies for Thriving in the Age of Generative AI: The Role of Learning Analytics

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Abstract

This editorial looks back at the Journal of Learning Analytics (JLA) in 2024 and forward to 2025. The first section of this editorial considers how learning analytics and Generative AI might be used to help students to develop a broad range of skills and competencies and identifies some promising directions for research in this area. The second section looks back over the past year, providing statistics on submissions and noting recent changes to the journal, including changes to licensing and the introduction of a new Editorial Board and Senior Editorial Board.

Keywords

Generative AI, GenAI, skills, competencies, learning analytics

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1. Introduction

The rapid changes in modern societies have resulted in an increasing push towards the development of transferable skills and competencies that have the potential to help students be effective in modern society. Known as 21st-century skills, soft skills, or transferable skills, they encompass a broad range of skills and competencies — such as communication, collaboration, creativity, critical thinking, problem solving, leadership — that have been deemed critical for success in rapidly developing and changing modern economies (Pellegrino, 2014). The recent development of Generative Artificial Intelligence (GenAI) and Large Language Models (LLMs) has intensified the debate about the development of such competencies, given that AI and automation will significantly change many existing jobs or render them obsolete (Khogali & Mekid, 2023). Advancements in GenAI also brought the need for new skills such as AI literacy, as understanding AI’s capabilities, limitations, and ethical dimensions, and knowing how to use AI responsibly have all become critically important. The question of how to best prepare students for a world with access to sophisticated AI has made questions related to competency and skill development increasingly critical (BenMessaoud, 2024).

While the importance of skills and competencies is well understood, there is far less clarity on how to best capture, measure, and evaluate them (Buckingham Shum & Deakin Crick, 2016). In many cases, their development is a byproduct of learning and assessing domain-specific knowledge, with limited attempts to give them a central place in the curriculum. Their assessment often involves self-assessments, which are highly prone to biases (Bergner, 2017; Bergner et al., 2017). Likewise, the pre/post-testing model lacks the ability to capture skill and competency development in cases other than tightly specified learning and assessment tasks (Barthakur et al., 2023). Finally, traditional competency and skill assessment methods rely heavily on psychometric modelling approaches that do not utilize the entire range of data available about student learning and the environments in which it occurs. In this regard, learning analytics provide significant opportunities for advancing competency and skill-based learning in several critical ways, particularly when combined with new GenAI and deep learning technologies.

Data collection. First, learning analytics supports the collection of data about student competency and skill development during their learning process rather than simply measuring competences by focusing on grades related to learning outcomes. The recent advances of GenAI make it important to shift attention to the process of learning rather than assessing the output of learning (Lodge et al., 2023). Learning analytics can also provide insights into student use of GenAI, providing information that can enable effective (i.e., conducive to student learning) adoption of GenAI in education. This is important since GenAI applications such as ChatGPT can support educational tasks and personalize learning, but students typically lack the skills to

use these tools effectively. Inappropriate use of GenAI has been shown to harm learning (Bastani et al., 2024), making the identification of productive uses and the prevention of harmful ones critical priorities.

Insights into competency and skill development. Second, learning analytics models can provide educational practitioners with insights about student competency and skill development. Usually, such insights are presented in a form of learning analytics dashboards (LADs; Verbert et al., 2020), providing information critical for effective instructional support. This data can be used to support improvements in continuous instruction, student support and in-time feedback provision, as well as the design of courses and learning experiences (Buckingham Shum & Deakin Crick, 2016). Here, advances in GenAI can be effectively combined with learning analytics to create more complex models that leverage GenAI advances without increasing bias and compromising model fairness.

Support personalization. Finally, learning analytics can be used to support personalization of learning experience as well development of AI-related skills and competencies. Learning analytics also enable students to master skills by evaluating their learning against predefined models of skill and competency development, such as Assessment and Teaching of 21st Century Skills (ATC21S) or Partnership for 21st Century Skills (P21).

The process of using learning analytics for competency and skill development is, of course, not without its issues and challenges. Here, we outline some of the promising directions for future learning analytics research that have the potential to improve measurement and assessment of complex skills and capabilities during the learning process:

1. **Evaluating the alignment of curriculum and student learning experience**, with the goal of finding discrepancies that get in the way of student skill and competency development. How can we utilize GenAI applications to better understand the opportunities for competencies and skills to be developed?

2. **Developing models of skill and competency development.** GenAI applications, such as AI-based tutors, chatbots, or simulation environments, generate rich data on student interactions. Research is needed to translate these data into meaningful indicators of competence or skill. For example, how do we assess the quality of a student’s decision-making process in a simulated environment, or the depth of their understanding when they engage in a dialogue with an AI-powered tutor?

3. **Assessing competency and skill evaluation over time.** While most current approaches focus on simple pre/post-test evaluations of student skill and competency development, learning analytics allow for more longitudinal analysis of student learning data, providing more sophisticated insights into student learning processes over time. Skills and competencies often develop in non-linear ways. For instance, a student may show rapid progress in one area and none in another. Longitudinal learning analytics could support more dynamic tracking of these individual learning trajectories, enabling more tailored interventions.

4. **Validity of data.** With AI technologies, there is a risk of data skew due to biases in algorithmic design or inaccuracies in how data is collected. It is important to develop models that assess the validity of the data used in measuring skills and competencies. Research into AI fairness and transparency will be essential to ensure that competency models accurately reflect diverse student experiences.

As we move towards more effective uses of GenAI in educational and workplace settings, it is important to understand how to combine LA and GenAI in ways that foster development of complex skills and competencies. We welcome articles that explore this important issue and shape its development and practical adoption in formal education and beyond.

2. Submission Overview

During the last year (2024) the Journal of Learning Analytics received 169 submissions, which is an increase over previous years. During the year, 77 submissions received a “desk reject” from the editors and were not sent for further review. Most papers that were “desk rejected” did not focus on learning analytics. The percentage of desk rejections is lower than in previous years due to increasing quality of the original submissions.

Table 1. Journal Publication Statistics, 2019–2024

| | 2019–2020 | 2020–2021 | 2021–2022 | 2022–2023 | 2023–2024 |
|-----------------------------|-----------|-----------|-----------|-----------|------------|
| Received during the year | 82 | 93 | 115 | 159 | 169 |
| Accepted during the year | 19 | 33 | 29 | 22 | 43 |
| Acceptance rate | 44% | 23% | 12% | 14% | 16% |
| Declined (desk reject) | 24 | 56 | 70 | 101 | 77 |
| Declined rate (desk reject) | 32% | 63% | 76% | 64% | 64% |
| Declined (after review) | 29 | 22 | 15 | 22 | 32 |

| | | | | | |
|------------------------------|-----|-----|-----|-----|------------|
| Declined rate (after review) | 24% | 14% | 12% | 14% | 20% |
|------------------------------|-----|-----|-----|-----|------------|

*Note: Papers received during one calendar year may be accepted or rejected in the following calendar year. Some papers received in 2023 were still under review when these figures were generated on 2 November 2024.

Of the papers sent for review this year, 43 were accepted and 32 declined. As compared to the previous year, during which 22 papers were accepted, the increase in acceptance by 21 papers (almost 100%) is considerable. This could be explained by the journal’s recently established Impact Factor of 3.9. The overall acceptance rate is 16% is slightly higher than the 14% of the previous calendar year. Table 1 provides figures for the past five years.

Three journal issues were published in 2024. Table 3 presents details (paper types, total contributions, authors and countries represented) of papers published in the journal. Volume 11.1. presents a collection of articles included in the special issue focusing on Learning Analytics in Latin America, edited by Hilliger, Ceballos, Maldonado-Mahaud, and Ferreira (Hilliger et al., 2024). The nine papers included in this issue demonstrate practical implementations and discuss the implications and possible future trajectories for learning analytics research, especially tailored for the Latin American academic community. Volume 11.2 included 15 regular research papers and three other types of papers, including those that fall into the categories of “data and tools reports” (Patidar et al., 2024), “extended conference papers” (Seidenberg et al., 2024), and “practical reports” (Wasson et al., 2024). Finally, the current issue (Vol. 11.3) presents a novel collection of 13 research papers, published by 47 contributing authors from nine countries (Table 2).

Table 2. Details of Papers Published in 2024 by Issue

| Issue | Research Papers | Other Papers (Data & Tools, Practical Reports, Extended Conference Papers) | Total Contributing Authors | Total Countries Represented |
|--|-----------------|--|----------------------------|-----------------------------|
| Volume 11.1 | 9 | 0 | 48 | 9 |
| Volume 11.2 | 15 | 3 | 92 | 14 |
| Volume 11.3 (Early Access, Copyediting and Production) | 13 | 2 | 47 | 9 |

Table 3. Country of Residence of 182 JLA Authors of Papers Published from 1 January 2024 to 3 November 2024

| Country | Authors | Country | Authors |
|-----------|---------|--------------|---------|
| Australia | 21 | Ireland | 3 |
| Belgium | 7 | Israel | 2 |
| Brazil | 10 | Mexico | 12 |
| Canada | 2 | Netherlands | 5 |
| Chile | 13 | Norway | 6 |
| Ecuador | 1 | Saudi Arabia | 1 |
| Estonia | 4 | Spain | 5 |
| Finland | 14 | Sweden | 4 |
| France | 6 | Türkiye | 2 |
| Germany | 15 | UK | 1 |
| India | 1 | USA | 35 |

3. JLA Developments

Starting with the current issue, all papers in the journal will be published using the Creative Commons CC BY 4.0 licence. This aligns the journal’s policy with that of major grant-giving bodies. For example, Horizon Europe funding comes with an explicit obligation to publish scientific, peer-reviewed publications “under the latest available version of the Creative Commons Attribution International Public Licence (CC BY) or a licence with equivalent rights.” The European Commission adopted CC

BY 4.0 and CC0 in 2019 and, in the United States, the NSF does not require a specific licence but does require public access.

This continues the JLA's long-term commitment to open-access publication. Previous issues have been licensed using the more restrictive CC BY-NC-ND 3.0 licence. Papers in those issues are unaffected by this change and retain their original licence.

CC BY 4.0 states that users are free to copy and redistribute the material in any medium or format for any purpose, even commercially. They are also able to remix, transform, and build upon the material for any purpose, even commercially. However, when doing so, they must give appropriate credit, provide a link to the license, and indicate if changes were made. This can be done in any reasonable manner, with certain restrictions. To view the full details of CC BY 4.0 license, it would be helpful to see: <https://creativecommons.org/licenses/by/4.0/deed.en>.

This year, researchers in the learning analytics community were invited to join the Journal of Learning Analytics editorial board to play an active role in the journal's operations. The responsibilities of board members include:

- **Strategic Input:** Providing guidance on the journal's direction, policies, and practices, thereby contributing to its continued growth and relevance in the field.
- **Community Engagement:** Acting as ambassadors for JLA within the LA community, helping to enhance its visibility and influence.
- **Manuscript Review:** Reviewing up to six manuscripts per year to ensure the quality of published articles in the journal.

Members of both the Editorial Board and the Senior Editorial Board are listed on the Editorial Team page and we thank all those who came forward to take on this role.

Our thanks also go to all those who played other key roles in making the journal a success this year, particularly to the journal's editorial assistant Sameen Reza, the copy editors, and the production editors. Thank you to the Society for Learning Analytics Research (SoLAR) for providing the funding to make this a truly open-access journal that does not charge for submission, publication, or access. Special thanks, as always, go to our authors and reviewers for contributing both time and expertise to the journal.

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