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Exploring the Functions of Learning Analytics Dashboard that Supports Students from Both the Perspective of Self-Regulated Learning and Career Planning

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Abstract—This study explores the potential functionalities of Learning Analytics Dashboards (LADs) aimed at supporting both self-regulated learning and career planning. While previous research on LADs has primarily focused on visualizing learning outcomes to support self-regulated learning, there remains a gap in providing actionable guidance that integrates career planning. To address this issue, we adopted Participatory Design Research (PDR), engaging university students with diverse career aspirations in the design process. Participants identified desired dashboard features from the dual perspectives of learning support and career development. Analysis results revealed that students without clearly defined career goals sought functionalities that allow them to reflect on their objectives by referencing the experiences of peers with a similar major. In contrast, students with specific career plans desired features that provide insights into the academic and professional paths of alumni in related fields. This study contributes novel insights into dashboard design, emphasizing the importance of aligning learning analytics with university students' career goals and aspirations. Future work will involve developing and evaluating a prototype to assess the efficacy of these integrated support functionalities in enhancing both self-regulated learning and career planning among students.

Keywords—learning analytics dashboard, self-regulated learning, career planning, higher education

I. INTRODUCTION

As the digitalization of education progresses, various types of data (e.g., learning logs in LMS) are now being handled in educational settings. One study that aims to utilize such data for educational improvement is dashboard research. By visualizing data related to learning, such as daily learning logs and class questionnaires, it is possible to visualize learners' learning outcomes and provide suggestions for supporting their next learning.

However, there are criticisms that the learning support envisioned based on such visualizations lacks concrete assistance, leading to actual learning improvements [1]. In contrast, in the field of academic advising systems, mechanisms

have been developed to support learners in making decisions about subjects, majors, and programs based on their academic performance and interests[2], thereby encouraging them to take specific subsequent actions. Nevertheless, these systems face key challenges, including the effective use of detailed behavioral and academic data, as well as the need to expand their scope beyond learning improvement to encompass career planning.

The ultimate goal of this study is to develop a LAD that provides information to help students not only improve self-regulated learning from a micro perspective at the course level but also consider their next learning actions with their future careers in mind. As the first step, the purpose of this paper is to gain insights into the design of a LAD equipped with support functions that consider learners' academic achievements and career orientations. In designing the LAD, two approaches can be considered: a top-down approach that examines necessary support based on educational theories, and a bottom-up approach that investigates learners' needs. In this study, we adopted Participatory Design Research (PDR) [3], which can be regarded as one of the latter methods, to explore students' preferences.

II. LITERATURE REVIEW

Studies on the design of Learning Analytics Dashboards (LADs) employing the Participatory Design Research (PDR) approach have adopted methods in which users are involved from the ideation and design stages [4][5]. The design guidelines derived from these studies emphasize the need for features that support all phases of self-regulated learning - namely, forethought, performance, and self-reflection - and highlight the importance of functionalities such as effective learning planning, management, and visualization of learning outcomes. Specific examples include visualizations of task completion status, deadline reminders, access time and frequency to learning resources, individual grades, overall grade distributions, feedback based on learning performance, and predictions of future academic performance [6][7].

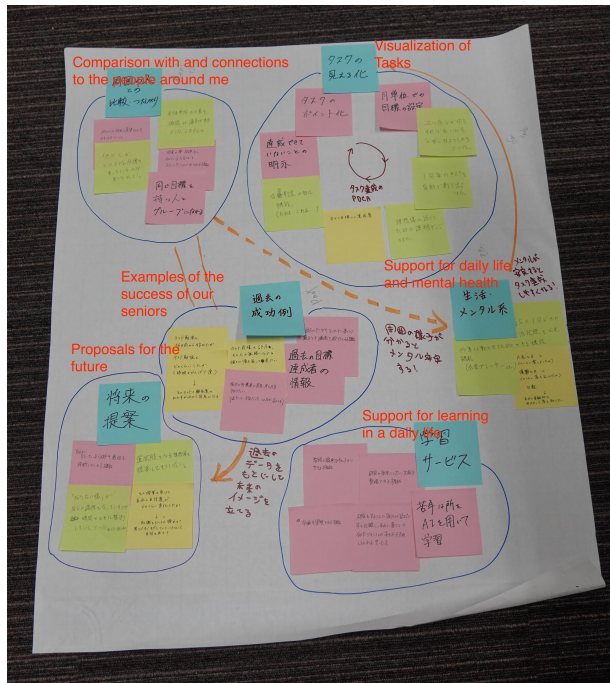


Fig. 1. Poster of a group of students looking for employment

While these features have been suggested to positively influence learners' study attitudes and motivation, there is also a growing demand for LADs to support not only academic performance but also career goals [8]. In the field of academic advising systems, emerging systems have begun to utilize generative AI and learning analytics technologies to recommend educational programs based on students' academic backgrounds and interests [9]. However, what specific types of support learners need when considering career pathways remains unclear.

The aim of this study is to identify the required functionalities for LADs that support both academic achievement and career orientation, and to examine whether these needs vary depending on learners' career aspirations. This research aims to contribute new insights to address the gap identified in previous studies concerning the lack of support for career planning.

III. WORKSHOP FOR DESIGN A DASHBOARD

Using a Participatory Design Research (PDR) approach, a workshop was conducted at the authors' affiliated university with prior ethical approval.

Seventeen students participated: 14 undergraduates (ranging from first- to fourth-year) and 3 graduate students. Participants completed a pre-workshop questionnaire on their career goals and were grouped accordingly: private sector employment (4), graduate school (4), study abroad (3), public/medical sector (3), and current graduate students (3).

Participants first received an explanation of the dashboard's purpose. They then individually wrote desired dashboard features on sticky notes, shared and discussed these in career-oriented groups, clustered the notes on posters (Fig. 1), and presented their outcomes to other groups.

As for the analysis, two researchers categorized all sticky notes into learning support, career support, or others (e.g., mental health or system functions), achieving an inter-rater agreement of 84%. Further subcategorization was based on self-regulated learning (forethought, performance, reflection) and career exploration (information gathering, learning from others, self-understanding) [10][11], with 76% agreement, resolving disagreements through discussion.

IV. RESULTS

Fig. 2 illustrates the number of the sticky notes that are related to the categories (learning or career) in each group. The analysis revealed the following differences in the functions requested by students according to their career goals.

Private sector employment group emphasized self-regulated learning (especially forethought) and career features like "learning from others" and "self-understanding." Students expressed interest in knowing the paths taken by alumni and identifying suitable career options.

Graduate school aspirants similarly highlighted "learning from others" and "self-understanding," requesting tools that reflect their current status and suggest career possibilities.

Study abroad candidates focused more on information gathering - such as requirements, scholarships, and post-study employment - alongside learning from alumni experiences.

Medical/public sector group emphasized the need for information about skills and coursework related to specific occupations and insights from alumni with different academic backgrounds.

Graduate students mainly sought information on courses taken by seniors and related career paths, as well as resources like academic conferences and lab details.

V. IMPLICATION FOR DESIGNING A DASHBOARD AND FUTURE WORK FOR DEVELOPING A PROTOTYPE

The types of dashboard features students requested appear closely tied to the clarity of their career goals. Those with less defined goals (e.g., undergraduates seeking employment or graduate studies) showed stronger interest in features for self-understanding and peer-based reference. For these students, dashboards that visualize alumni course choices and career outcomes may assist in aligning learning with future goals.

Conversely, students with clearer goals - such as those aiming to study abroad, work in specialized fields, or already in graduate school - sought targeted information to support well-defined plans. For them, dashboards could provide concrete data about career-aligned learning paths.

Although learning support features were less frequently requested by students outside the employment group, this does not suggest such support is unnecessary. The high self-regulation skills of students at the institution, along with the voluntary nature of workshop participation, may have influenced these results.

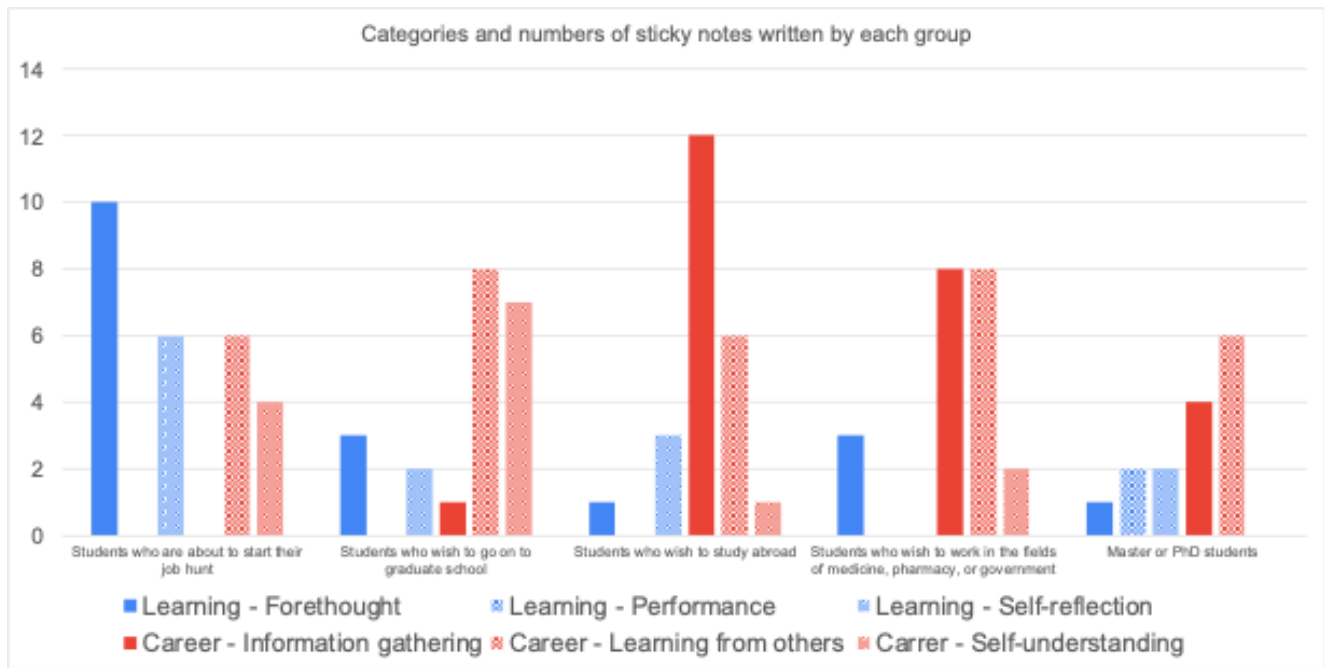


Fig. 2. Types and number of ideas for dashboard functions written by students

The study also sheds light on students' interest in peer and alumni data during career exploration - a relatively underexplored area. While prior studies have cautioned against using peer comparison due to potential negative effects on motivation, this study indicates that peer information can be valuable when framed in the context of career development. Dashboard design should thus carefully balance comparability and personalized guidance.

VI. CONCLUSION

In this study, we explored the potential functionalities of a LAD designed to support learners from both self-regulated learning and career planning perspectives, utilizing a co-design approach. When categorizing the features desired by learners based on their career orientations, it was found that students without clearly defined career goals sought functionalities that would allow them to reflect on their goals by referencing information from peers with similar career aspirations. Conversely, students with more defined career objectives expressed a desire to refer to the career paths of alumni who pursued similar careers, to help guide their future activities.

Moving forward, we will develop a prototype based on these insights and conduct preliminary evaluations. Following this, we will proceed with the final development and practical implementation of the dashboard. The effectiveness of the LAD in supporting both self-regulated learning and career planning among students will then be assessed.

REFERENCES

- [1] N. Valle, P. Antonenko, K. Dawson, & A. C. Huggins-Manley, "A systematic literature review on learner-facing learning analytics dashboards," *British Journal of Educational Technology*, vol.52, pp.1724-1748, Jul. 2021, doi: 10.1111/bjet.13089.
- [2] O. Iatrellis, A. Kameas, P. Fitsilis, "Academic Advising Systems: A Systematic Literature Review of Empirical Evidence," *Education Sciences*, Dec. 2017, vol. 7, no. 4, 90, 2017, doi: 10.3390/educsci7040090
- [3] P. Reimann, "Design-based research," In *Methodological choice and design*, Netherlands: Springer, 2010, pp. 37–50.
- [4] N. Seidel, V. Meyer and S. Radovic, "Co-Design of an Adaptive Personalized Learner Dashboard," in *2024 IEEE International Conference on Advanced Learning Technologies (ICALT)*, Nicosia, North Cyprus, Cyprus, Jul. 2024, pp. 26-28, doi: 10.1109/ICALT61570.2024.00014.
- [5] I. Villagrán, "Enhancing Feedback Uptake and Self-Regulated Learning in Procedural Skills Training: Design and Evaluation of a Learning Analytics Dashboard", *Learning Analytics*, vol. 11, no. 2, pp. 138-156, Jul. 2024.
- [6] G. Ramaswami, T. Susnjak, and A. Mathrani, "Effectiveness of a Learning Analytics Dashboard for Increasing Student Engagement Levels", *Learning Analytics*, vol. 10, no. 3, pp. 115-134, Dec. 2023.
- [7] D. S. Fleur, "IguideME: Supporting Self-Regulated Learning and Academic Achievement with Personalized Peer-Comparison Feedback in Higher Education", *Learning Analytics*, vol. 10, no. 2, pp. 100-114, Aug. 2023.
- [8] L. de Vreugd, A. . van Leeuwen, R. Jansen, and M. van der Schaaf, "Learning Analytics Dashboard Design and Evaluation to Support Student Self-Regulation of Study Behaviour", *Learning Analytics*, vol. 11, no. 3, pp. 249-262, Oct. 2024.
- [9] E. Gedrimiene, I. Celik, A. Kaasila, K. Mäkitalo and H. Muukkonen. "Artificial Intelligence (AI)-enhanced learning analytics (LA) for supporting Career decisions: advantages and challenges from user perspective," *Educ Inf Technol*, vol. 29, pp. 297–322, Jan. 2024. <https://doi.org/10.1007/s10639-023-12277-4>
- [10] T. Adachi. "Evaluation of the Initial Stage Career Exploration Inventory (ISCEI)," *The Japanese Journal of Psychology*, vol. 81, vol.2, pp. 132-139, Sep. 2010. doi: 10.4992/jjpsy.81.132
- [11] T. Adachi. "Career consciousness among Japanese female students: Relationships between vocational motivation and career exploration," *The Japanese Journal of Psychology*, vol. 79, no. 1, pp. 27-34, May 2008.