



Collaborating with Aled for better student-teacher reconnection

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The global pandemic has caused much disruption to higher education, but especially that of student-teacher relations as students and teachers struggle to adapt to emergency remote teaching. As the pandemic restrictions ease globally, students and teachers see an opportunity to reconnect. But the development of artificial intelligence in education (Aled) is perceived as a potential disruption to student-teacher relationship. Hence, teachers have understandably viewed Aled with suspicion and with a sense of inevitability. However, teachers should not treat Aled as ‘the enemy’. Working collaboratively with Aled could enhance student-teacher reconnection efforts, and by recognizing where Aled should take the lead and where the human teacher should take the lead in building that relationship, the fear that Aled would disrupt student-teacher relations can be dispelled.

Keywords: Artificial Intelligence, Higher Education, Student-teacher reconnection

Introduction

Teaching has always been a complex job (Grossman, 2020), and teaching online even more so. With changing times students expectations have changed and teachers now have to juggle many aspects of teaching on top of the shift to teaching online, with limited success for both teachers and students (Arslan, 2021; Collie, 2021). One of the key concerns is the student-teacher disconnect that has arisen from the sudden shift to deliver education online (Almahasees et al., 2021; Arslan, 2021). Even as general pandemic restrictions gradually ease, this sense of disconnectedness from suddenly studying online is likely to continue because of many reasons and one of them is pandemic concerns continue to linger (Bashir et al., 2021), and the other is student flexibility of studying online (Driscoll et al., 2012). However, student-teacher relationships still remain important (Dhawan, 2020), despite the disruptive effects of COVID-19.

The advancements in Artificial Intelligence (AI) have painted AI as a helpful tool for teachers in reconnecting with student and fostering the relationship (Koh et al., 2022). AI can help take over multiple administrative roles and can perform tasks that teachers perform, theoretically allowing teachers to have more free time to better focus on learning and teaching and devising different ways of connecting with students. However, AI has now started to advance into areas such as the development and creation of study materials, even to some extent, the delivery of course material and information.

Given recent developments of AI in education (Aled) (Hwang et al., 2020), and the resource constraints of many educational institutions (Friedman et al., 2020), many have wondered if this meant that Aled will now be the latest disruption to student-teacher relationship. As such, this paper will investigate *how an Aled system could contribute to the post-COVID-19 desire for the student-teacher to reconnect.*

Aled and the Role of the Teacher

The initial purpose of Aled was to shift administrative burdens from the teachers so as to allow teachers to theoretically focus on the more human aspects of education (such as empathy, personal guidance etc). Currently, Aled has already progressed to the point of knowledge transmission, where the Aled ‘teach’ to a limited extent by using pre-built educational packages which would have included the content material, some level of academic support, monitoring and evaluation (Koh et al., 2022). This, in no small way, has alarmed many teachers (Celik et al., 2022), seeing this as a first step to reducing the teacher’s role to that of a facilitator, which also has implications on the student’s learning experience (Shen & Su, 2020). However, as with the introduction

of any technology (not just AIed), the role of the teacher will evolve naturally. For instance, Qbot (Microsoft, 2020) can pick out struggling students and flag them out to the teacher. Teachers can then intervene just-in-time with the right approach given the right background information. This gives students an opportunity to reconnect with their teachers in a meaningful manner, allowing a human touch to be present in the aspect of teaching. AI can also provide a personalised study guide for each student, but the human teacher can add to the study guide by including personal stories relevant for the student to learn, and even ways to motivate the student based on their past interactions with the student.

But this is not only for connecting with struggling students. AI can be used to create engaging content for the teachers who may understandably not be well versed in some software or to help re-enforce certain ideas. Instead of choosing between a ‘sage on the stage’ and ‘a guide on the side’, teachers can work with AI to play both roles, by providing knowledge and encouragement at the same time. AI can then help tweak or personalise the knowledge and the teacher can then add their final personal touch for the student (Joshi et al., 2021).

These examples show that the role of the teacher will shift from a more traditional ‘sage on the stage’ to a ‘guide on the side’. Teachers and AIed will take turns taking the lead on student-teacher reconnections depending on the task at hand. These tasks can be placed along a spectrum of teaching tasks, starting from a total procedural task and ending at pastoral care tasks (Fig 1). This spectrum incorporates some of Bloom’s Taxonomy in terms of the identification of the order of thinking. This helps give certain points along the spectrum easier to identify. However, teaching is not solely about the order of thinking skills. Other aspects such as administrative tasks and pastoral care have been added to give more context to the types of task a teacher would expect in today’s world of online learning. The level of AI involvement depends on the type of task, which can be led more by a teacher or AIed or even co-led. Naturally, as the type of task moves from a more procedural task to a more pastoral care task, the teacher must also increasingly lead the way that the student-teacher connections are formed.

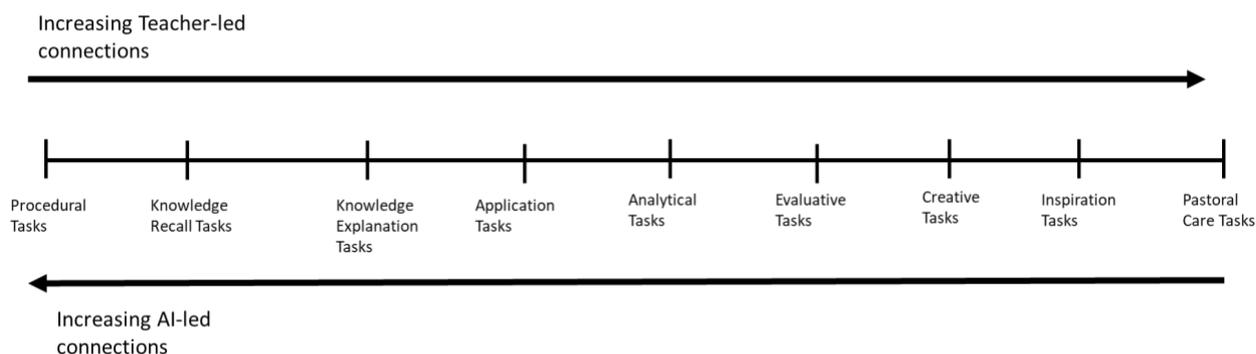


Figure 1: Spectrum of Teacher-AI teaching tasks

Procedural tasks refer to the tasks that usually administrative in nature, such as the request for deadline extensions and reuploading of correct documents. These tasks can be AIed led and the teacher will play a smaller role in such tasks.

Teaching tasks that involve lower order thinking tasks such as knowledge recall and explanation tasks can be more AI led as well. The delivery of content, especially in an online learning environment, can be conducted more by the learning platform. Explanatory questions can also be answered by AIed, although teachers would have to play a bigger role to ensure that the context and content is appropriate. Similarly, as the teaching tasks start to involve higher order thinking skills, the teacher would have to play an increasingly larger role. This would involve evaluative and creative tasks, where a more ‘humanistic’ approach would need to be adopted toward teaching.

But teaching also involves the non-academic skills such as motivating students, inspiring them broadening their horizons. These tasks must be teacher-led, as the all-important student-teacher relationship takes centre stage. AIed can help in a limited aspect, for instance, providing a record of past interactions or possible new aspects, but the teacher must connect with the student to complete these tasks. Pastoral care tasks involve the actual care and counsel of the student’s wellbeing, and the human touch is even more important in this aspect.

Moving from the extremes, teaching tasks involving application and analytical thinking skills tend to be more of a co-led area. AIed can show how well students have been applying certain concepts, but the teacher also needs to provide the context and the relevance of how a concept is applied. Additionally, teachers can provide their

personal stories and their personal experiences on how concepts are applied and understood, providing additional opportunities for reconnection.

Aled as a partner

If used properly, Aled can be a partner in helping students reconnect with teachers. By where the task lies on the spectrum (Fig 1), Aled can support the highly important student-teacher relationship by allowing a 'humanisation' of the online teaching. Amongst the three types of interactions (learner-content, learner-learner, learner-instructor) identified by Moore (1989), Martin and Bollinger (2018) has found that the learner-instructor interaction to be most important. This is also supported by other studies showing how a good learner-instructor interaction can result in higher levels of motivation and engagement (Koh, 2021; Zilka et al., 2018) and a better learning experience.

A Highly Accessible Student-Teacher Reconnection

In an online learning environment, students are not expected to study only during fixed office hours (Almendingen et al., 2021; Pérez et al., 2020). At that point of study, having a response from the teacher (even if it is via the Aled) helps students to remain connected to the teacher. As Aled takes over procedural tasks and queries, teachers can connect with students on a different level (inspiring task). For instance, a student may ask the Aled about submission deadlines at 3am in the night and then ask the same question again in a few days' of time. The human teacher may see this as an opportunity to connect with the student to see if there is some level of assessment anxiety. This action will be supported by the Aled's information and prediction. But most importantly, the Aled and human collaboration would have stretched across the odd hours of the day providing an avenue for connection and reconnection.

This sense of timeliness also speaks to the instantaneity of response. The instant response allows the student to keep the connection with the material that they are studying and give teachers an insight into the student's learning process. This allows teachers to know when and how to intervene and gives students and teachers an excellent reconnection opportunity. Additionally, it reduces the probability that the teacher forgetting or missing out on the query, all of which communicates a poor nonverbal communication cue to the student (Koh, 2021).

This accessibility also extends beyond that of time. Students no longer need to physically be in the same room as their teacher to form meaningful connections (Luckin et al., 2016). Aled allows students to be able to reach out virtually if they have internet access. This means that specific technological needs (such as the need for laptops, PCs etc) may not be as important as personal mobile phones may be sufficient. The lack of need for specific technology can also be argued as reducing the barriers to connection caused by unequal access to technology (Sharma et al., 2022).

Critically, the accessibility of time and space means that learning can now fit around the other aspects of daily life. Students can choose to hold full time jobs and connect with their teachers in a different manner, bringing different experiences and perspectives into their 'classroom'. This makes the connection between the student and teacher seem more authentic as the 'real self' maybe presented (Al Tawil, 2019). Bringing in personal experiences also help inspire and encourage students accordingly, even in an online environment (Singh, 2021).

New Ways of Learning that Reconnect

Aled will create new opportunities for connection via the new ways of learning. Using the spectrum above, this can be broadly categorised as AI-led and teacher-led (which also implies that it is AI-empowered). AI-led teaching can be seen in the form of the delivery of content and assessments. Personalised content delivery and data-driven productive learning activities can be designed by Aled (Hwang et al., 2020) as part of the teaching tasks of content delivery. In practice, students will get access to the course material, and a study guide that is catered to their learning behaviours and previously identified content. Teachers can complement this process by conducting higher level teaching tasks such as inspiring and motivating students. This could be supported by Aled as the information gathered from the student's learning behaviour can be applied contextually and appropriately to promote learning performances, enhance motivation and increase engagement.

Whilst AI-graded assessments are still in development (Manyika et al., 2017; UNESCO Education 2030, 2019), it also proposes a new way of student-teacher connection. Assessments will typically fall under the 'middle' level of teaching tasks, where both Aled and teachers will have to co-lead in varying degrees. AI-led assessments can be applied in the levels of explanation and description of concepts (Gardner et al., 2021; Jia,

2009). Teachers can provide context to some of the answers provided, but should take the lead in the assessment higher order skills such as creativity and analysis (Jimenez-Mavillard & Suarez, 2022). This new assessment collaboration will also necessitate a new way that students need to connect with teachers. Students will now connect with teachers on the higher order teaching/learning tasks, such as application and analysis, rather than more foundational tasks such as explanation and information recall. Theoretically, AIed can potentially develop to the point where it will conduct continual assessment of students' learning progress (Restrepo-Calle et al., 2018) and allow thus enhancing student-teacher reconnection without worrying about looming examination.

Finally, the social presence aspect should also not be excluded. Studying online can be an isolating experience (Dixon, 2015) and AIed can help breach that divide by supporting a community of inquiry approach. AIed can help draw connections for students who seem to be struggling in similar areas, setting up breakout rooms with teacher support or even enforcing some rules within online discussion spaces. Relevant content can be selected to support the discussion and the teacher can make use of that selected content to enrich the discussions.

Summary and Future Work

Although it may be tempting to say that the role of teachers will dwindle once AIed is implemented, that is simply not likely to happen (UNESCO Education 2030, 2019). Teachers still provide the 'human touch' in learning which help develop non-academic skills such as emotional intelligence, creativity, and communication skills (Manyika et al., 2017; Martin et al., 2018). Above and beyond the non-academic skills, human teachers are able to inspire and encourage accordingly, using their own experiences and knowledge, even in an online environment (Singh, 2021).. In an AI enhanced online post COVID-19 educational landscape, the student-teacher relationship still remains as critical as ever. As with any tool, AIed can be both disruptive and supportive. However, a good awareness of the task at hand would allow for a better collaborative effort between teachers and AI which in turn aids the way that teacher and students reconnect. In this 'new normal', AIed can enhance the student-teacher reconnection and build better connections depending on how AIed is deployed.

Given the impending march of AI into the online classrooms, a positive AI-Teacher collaboration can be built by having a good understanding on where each task sits on the AIed-Teacher spectrum. Future work can take this understanding into the design of future AIed applications, where the application will be designed to facilitate collaboration with the teachers depending on the task on the spectrum. Future refinements of the spectrum are also welcome. This will provide a fine-grained definition of each point of the spectrum, updating it as the relationship between technology and the human teacher evolves. This will also allow for new avenues of the student-teacher connection to be established and this will then inform future refinements of the spectrum.

References

- Al Tawil, R. (2019). Nonverbal Communication in Text-Based, Asynchronous Online Education. *The International Review of Research in Open and Distributed Learning*, 20(1). <https://doi.org/10.19173/irrodl.v20i1.3705>
- Almahasees, Z., Mohsen, K., & Amin, M. O. (2021). Faculty's and Students' Perceptions of Online Learning During COVID-19. *Frontiers in Education*, 6. <https://doi.org/10.3389/feduc.2021.638470>
- Almendingen, K., Morseth, M. S., Gjølstad, E., Brevik, A., & Tørris, C. (2021). Student's experiences with online teaching following COVID-19 lockdown: A mixed methods explorative study. *PLOS ONE*, 16(8), e0250378. <https://doi.org/10.1371/journal.pone.0250378>
- Arslan, G. (2021). Loneliness, College Belongingness, Subjective Vitality, and Psychological Adjustment during Coronavirus Pandemic: Development of the College Belongingness Questionnaire. *Journal of Positive Psychology and Wellbeing*, 5(1), 17–31. <https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/en/covidwho-1226082>
- Bashir, A., Bashir, S., Rana, K., Lambert, P., & Vernallis, A. (2021). Post-COVID-19 Adaptations; the Shifts Towards Online Learning, Hybrid Course Delivery and the Implications for Biosciences Courses in the Higher Education Setting. *Frontiers in Education*, 6. <https://doi.org/10.3389/feduc.2021.711619>
- Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). The Promises and Challenges of Artificial Intelligence for Teachers: a Systematic Review of Research. *TechTrends*. <https://doi.org/10.1007/s11528-022-00715-y>
- Collie, R. J. (2021). COVID-19 and Teachers' Somatic Burden, Stress, and Emotional Exhaustion: Examining the Role of Principal Leadership and Workplace Buoyancy. *AERA Open*, 7, 1–5. <https://doi.org/10.1177/2332858420986187>
- Dhawan, S. (2020). Online Learning: A Panacea in the Time of COVID-19 Crisis. *Journal of Educational Technology Systems*, 49(1), 5–22. <https://doi.org/10.1177/0047239520934018>

- Dixson, M. D. (2015). Measuring student engagement in the online course: The online student engagement scale (OSE). *Online Learning Journal*, 19(4). <https://doi.org/10.24059/olj.v19i4.561>
- Driscoll, A., Jicha, K., Hunt, A. N., Tichavsky, L. & Thompson, G. (2012). Can Online Courses Deliver In-class Results? *Teaching Sociology*, 40(4), 312–331. <https://doi.org/10.1177/0092055X12446624>
- Friedman, S., Hurley, T. & Fishman, T. (2020). *COVID-19's impact on higher education: Strategies for tackling the financial challenges facing colleges and universities*. Deloitte. <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/public-sector/us-gps-covid-university-finance.pdf>
- Gardner, J., O'Leary, M. & Yuan, L. (2021). Artificial intelligence in educational assessment: 'Breakthrough? Or buncombe and ballyhoo?' *Journal of Computer Assisted Learning*, 37(5), 1207–1216. <https://doi.org/10.1111/jcal.12577>
- Grossman, P. (2020). Making the Complex Work of Teaching Visible. *Phi Delta Kappan*, 101(6), 8–13. <https://doi.org/10.1177/0031721720909580>
- Hwang, G.-J., Xie, H., Wah, W. B. & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, 1(100001), 1–5. <https://doi.org/10.1016/j.caeai.2020.100001>
- Jia, J. (2009). An AI Framework to Teach English as a Foreign Language: CSIEC. *AI Magazine*, 30(2). <https://doi.org/10.1609/aimag.v30i2.2232>
- Jimenez-Mavillard, A. & Suarez, J. (2022). A computational approach for creativity assessment of culinary products: the case of elBulli. *AI & SOCIETY*, 37, 331–353. <https://doi.org/10.1007/s00146-021-01183-3>
- Joshi, S., Rambola, R. K., & Churi, P. (2021). Evaluating Artificial Intelligence in Education for Next Generation. *Journal of Physics: Conference Series*, 1714(1), 012039. <https://doi.org/10.1088/1742-6596/1714/1/012039>
- Koh, J. (2021, April). The Role of Non-Verbal Communication (NVC) in asynchronous online learning. *FLANZ 2021: A Focus on Flexible Learning*.
- Koh, J., Cowling, M. A., Sim, K. N., & Jha, M. (2022). *Ways AI will change teaching and learning*. Campus Morning Mail. <https://campusmorningmail.com.au/news/ways-ai-will-change-teaching-and-learning/>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence Unleashed: An argument for AI in Education*. <https://discovery.ucl.ac.uk/id/eprint/1475756/>
- Manyika, J., Chui, M., Miremadi, M., Bughin, J., George, K., Willmott, P., & Dewhurst, M. (2017). *A future that works: automation, employment, and productivity*. <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>
- Martin, F., & Bolliger, D. U. (2018). Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment. *Online Learning Journal*, 22(1), 205-222. <https://files.eric.ed.gov/fulltext/EJ1179659.pdf>
- Martin, F., Wang, C., & Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education*, 37, 52-65. <https://doi.org/10.1016/j.iheduc.2018.01.003>
- Microsoft. (2020, January). *QBot is here – Creating learning communities supporting inclusion and social learning in Teams for Education!*
- Moore, M. G. (1989). Editorial: Three types of interaction. *American Journal of Distance Education*, 3(2), 1-7. <https://doi.org/10.1080/08923648909526659>
- Pérez, J. Q., Daradoumis, T. & Puig, J. M. M. (2020). Rediscovering the use of chatbots in education: A systematic literature review. *Computer Applications in Engineering Education*, 28(6), 1549-1565. <https://doi.org/10.1002/cae.22326>
- Restrepo-Calle, F., Echeverry, J. J. R. & González, F. A. (2018). Continuous assessment in a computer programming course supported by a software tool. *Computer Applications in Engineering Education*, 27(1), 80-89. <https://doi.org/10.1002/cae.22058>
- Sharma, H., Soetan, T., Farinloye, T., Mogaji, E. & Noite, M. D. F. (2022). AI Adoption in Universities in Emerging Economies: Prospects, Challenges and Recommendations. In *Re-imagining Educational Futures in Developing Countries* (pp. 159-174). Springer International Publishing. https://doi.org/10.1007/978-3-030-88234-1_9
- Shen, L. & Su, A. (2020). *The Changing Roles of Teachers With AI*. <https://doi.org/10.4018/978-1-5225-7793-5.ch001>
- Singh, P. (2021). The Role of Teachers in Motivating Students to Learn. *Technolearn An International Journal of Educational Technology*, 11(1). <https://doi.org/10.30954/2231-4105.01.2021.6>
- UNESCO Education 2030. (2019). *Artificial Intelligence in Education: Challenges and Opportunities for Sustainable Development*. <https://www.gcedclearinghouse.org/sites/default/files/resources/190175eng.pdf>
- Zilka, G. C., Cohen, R. & Rahimi, I. (2018). Teacher presence and social presence in virtual and blended courses. *Journal of Information Technology Education. Research*, 17, 103-126.

Koh, J., Cowling, M., Jha, M. & Sim, K. N. (2022). Collaborating with AId for better student-teacher reconnection. In S. Wilson, N. Arthars, D. Wardak, P. Yeoman, E. Kalman, & D.Y.T. Liu (Eds.), *Reconnecting relationships through technology. Proceedings of the 39th International Conference on Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education, ASCILITE 2022 in Sydney*: e22126. <https://doi.org/10.14742/apubs.2022.126>

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