

Understanding and Promoting Epistemic Growth: Applying the AIR and Apt-AIR Frameworks

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Abstract: This symposium features eight projects that present findings and insights unfolding from the application of the AIR and/or Apt-AIR frameworks—two frameworks addressing the design and analysis of epistemic growth. Through dialogue within and across papers, we highlight the theoretical, methodological, and design advances these frameworks afford, from epistemic scaffolds to epistemic moves, and from social media contexts to classroom communities. We also discuss interfaces with other theoretical frameworks, including knowledge building, rightful presence, and self-regulated learning. This interactive session will promote insights into epistemic growth and how to promote it and into the development and application of frameworks for epistemic growth.

Symposium overview

The goal of this structured poster symposium is to advance research aimed at understanding and promoting epistemic thinking and growth. In particular, we explore new theoretical and empirical advances that emerge from use of the Apt-AIR framework, together with the associated AIR model (Barzilai & Chinn, 2018; Chinn et al., 2014). These interrelated frameworks have been used by growing numbers of researchers within the learning sciences and allied fields (e.g., Barzilai et al., 2020; Duncan et al., 2018; Greene et al., 2021; Tong & Chan, 2023; Yoon et al., 2023). Given the rapid expansion in the use of these frameworks, it is valuable for researchers using them to come together, share findings, and discuss theoretical and empirical advances that have emerged. For those in the audience who are using or considering using these frameworks, the symposium will provide valuable guidance on how to do so. For those in the audience interested more generally in epistemic thinking, it will raise broad issues that are central to research on learners' epistemologies.

Developing productive ways of knowing is vital for people to make good decisions in their personal and community lives. Concerns about productive ways of knowing have become even more pressing in the contemporary “post-truth” world, in which it is harder for people to discern what is true or accurate (Barzilai & Chinn, 2020). The widespread dissemination of misinformation and disinformation poses a threat to the well-being of people, to their communities, and to democracy itself (through undermining any shared ground on which to base public policy decisions and the privileging of demagoguery over expertise) (Sosa, 2015; Lewandowsky et al., 2023). Developing good ways of knowing also includes openness to consider new, alternative epistemologies when these may be productive. Achieving these goals requires useful frameworks for understanding various ways of knowing, as well as for showing how to design learning environments that can help people advance their ways of knowing.

The AIR model and the Apt-AIR framework provide lenses to analyze people's ways of knowing and to identify valuable goals for epistemic education. The AIR model (Chinn et al., 2014) specifies three components of epistemic thinking: (a) *Epistemic Aims* are the goals that people set for their epistemic thinking, along with the value associated with those goals. For instance, people might set the goal of determining whether it is accurate that climate is changing to guide because knowing this is important for civic action. (b) *Epistemic Ideals* refer to the disciplinary or everyday criteria or standards that are set to evaluate how well the aim has been achieved. For example, one might evaluate claims about climate change using standards of fit with expert judgment, fit with the evidence, or fit with the testimony of friends. (c) *Reliable epistemic processes* are cognitive or social processes that enable people to achieve their aims with a good likelihood of success. Strategies such as searching out multiple viewpoints and seeking information about whether there is expert consensus are reliable processes in a number of contexts. Thus, the AIR model provides a framework for identifying the aims, ideals, and reliable processes that people may use in different contexts.

The Apt-AIR framework (Barzilai & Chinn, 2018) was originally designed to enable educators to specify the goals of epistemic education. Following the work of the philosopher Ernest Sosa (2015), Barzilai and Chinn argued that the goal of epistemic education is promoting learners' *apt epistemic performance*, which refers to successful epistemic performance achieved through the exercise of epistemic competence. The Apt-AIR framework further unpacks apt epistemic performance in terms of five interrelated aspects of engagement with epistemic aims, ideals, and processes. These five aspects are: (a) *cognitive engagement with epistemic performance* through active use of appropriate aims, ideals, and reliable processes; (b) *adapting epistemic performance* flexibly as appropriate in various circumstances as warranted; (c) *metacognitive regulation and understanding of performance*, which refers both to people's metacognitive regulation of their people's cognitive engagement and their understanding of appropriate aims, ideals, and reliable processes; (d) *caring about and enjoying epistemic performance*; and (e) *engaging in epistemic performance with others* (e.g., consulting with friends, engaging in online social networks; appropriately using social means of knowledge production). Advancing learners' apt epistemic performance involves supporting engagement spanning all five aspects.

Since the publication of the AIR model and the Apt-AIR framework, research teams have used these frameworks across a variety of educational contexts. As researchers collectively apply and develop a research framework, it is valuable to bring scholars together to examine what has been learned as well as to scrutinize the affordances and challenges associated with the frameworks—from theoretical issues to implementation challenges. For example, the Apt-AIR framework was initially developed as a way to specify various goals for epistemic education, yet it is increasingly used as a descriptive framework, as well, which raises analytical and methodological challenges. Accordingly, the symposium posters and discussion will focus on these issues:

- How does each project engage with the AIR and/or Apt-AIR frameworks?
- What new findings, insights, designs and/or methodological advances have emerged?
- How do these findings and insights advance understanding of epistemic thinking or epistemic education?
- How, if at all, does AIR or Apt-AIR interface with any other theoretical frameworks?

Together, these questions will scrutinize novel development and applications of this body of work. Because the symposium involves eight separate projects (from four countries and three continents), it will afford discussion of a wide range of considerations of implementation and interfaces with other frameworks. For example, various projects link AIR or Apt-AIR with other frameworks including knowledge building, rightful presence, and self-regulated learning.

The session will begin with brief prerecorded firehose introductions to the posters (10 minutes), followed by 25 minutes for the audience to view the posters and talk with the presenters. After a 7-minute presentation by the discussant (Ala Samarapungavan, an expert in epistemic thinking and design), we will move to a 18-minute panel discussion by the authors and discussant; the panel will center particularly the last two questions in the list above. Through these activities, we will highlight new designs, new findings, and new analyses of epistemic thinking and instruction that promotes epistemic growth. We expect that the collective contributions of these papers will help advance thinking in the learning sciences community about how to advance epistemic education—that is how to design learning environments to advance epistemic growth, and how to investigate and assess learning in these environments.

How do epistemic scaffolds work? An Apt-AIR analysis

Sarit Barzilai and Sharona T. Levy

There are multifarious definitions of what epistemic scaffolds are and diverse assumptions about how they support learning. For example, some have defined them as tools for supporting forms of discourse and inquiry that are

congruent with those of scientific communities (Sandoval & Reiser, 2004); and others have construed them as supports that motivate or facilitate individual and group knowledge production (Stroupe et al., 2019). These definitions capture various aspects of this complex construct, yet it is still unclear what they share and how they relate to each other. Although the term “epistemic scaffolds” is often used, it is currently undertheorized and underspecified. This may hinder efforts to design scaffolds that can support epistemic growth.

Thus, the goal of our project is to offer a systematic theoretical analysis of the key affordances and functions of epistemic scaffolds. More specifically, we build on the Apt-AIR framework to analyze what epistemic scaffolds are and how they can be designed to support epistemic performance and growth. Our methodology combines theoretical analysis with a close inductive analysis of rich examples of epistemic scaffolds. Guided by a maximum variation sampling approach (Patton, 2015), we focus on two suites of digital epistemic scaffolds that address different types of epistemic practices, distinct forms of representation, and diverse domains. One suite, Much.Matter.in.Motion, supports students in computational modeling of systems in science through a complexity perspective (Levy et al., 2018). A second suite, the Knowledge Society Sandbox, supports inquiry and argumentation with multiple textual documents in history, language arts, science, and more (Barzilai et al., 2020).

Informed by the Apt-AIR framework, we define epistemic scaffolds as supports that enable learners to engage in apt epistemic performance, in ways they might not be able to on their own, and thereby promote learners’ epistemic growth. Epistemic scaffolds can be used to support engagement with various epistemic components (i.e., epistemic aims, ideals, and processes) which can be represented in diverse ways. We identify and illustrate several dimensions of *representation of epistemic components* in epistemic scaffolds, such as their specificity and explicitness. Intersecting with the representation of the epistemic components, we systematically analyze how epistemic scaffolds can *support engagement with epistemic components along the five aspects of epistemic performance* identified in the Apt-AIR framework. For example, cognitive engagement with epistemic ideals can be supported by externalizing or visualizing objects that represent these ideals and by cuing learners to manipulate them and observe the outcomes. Metacognitive engagement with epistemic ideals can be supported by actively engaging with them, labeling them, and encouraging discourse about them. The resulting map of affordances is then used to derive a set of scaffolding guidelines for supporting epistemic growth.

Our project advances the theoretical understanding of epistemic scaffolds by offering a comprehensive analysis of their affordances that can guide purposeful scaffold design. This analysis also demonstrates how the Apt-AIR framework can generatively inform the design of diverse scaffolds that support epistemic growth.

Mutuality and dynamism between epistemic thinking and self-regulation

Jeffrey A. Greene

The pursuit of knowledge in the modern world is no anodyne, coldly cognitive affair. Today’s knowledge seekers must be “competent outsiders” (Osborne & Pimentel, 2023, p. 5) who can not only evaluate the credibility of claims and sources but also understand the social practices used in disciplines to produce reliable knowledge. Apt-AIR’s epistemic thinking skills, knowledge, and dispositions (Barzilai & Chinn, 2018, 2020) are challenging to acquire but also are challenging to deploy, particularly when the pursuit of knowledge extends over long periods of time and across multiple incendiary topics. Thus, in the modern digital world, being a competent outsider with the competence to discern knowledge from misinformation requires the capacity to understand, manage, and productively direct the motivational, volitional, and emotional phenomena that permeate such thinking. In other words, effective epistemic thinking also requires the ability to effectively self-regulate (Greene, 2018).

Self-regulation is a broad concept including the many ways people plan, manage, and reflect upon multiple aspects of their experience (e.g., cognition, motivation, emotion, social interactions) to optimize their pursuit of desired goals (e.g., knowledge; Greene, Bernacki, & Hadwin, 2024). Epistemic thinking describes the pursuit of desired epistemic aims or goals (e.g., knowledge, a rationale view of the world), yet rarely has such thinking been integrated with theories of goal pursuit, such as self-regulation. Models of epistemic thinking would be enhanced by including three aspects of self-regulation: intellectual humility (Ballantyne, 2023), inhibitory control (Zelazo et al., 2016), and volition (Duckworth et al., 2019).

Ballantyne (2023) defined intellectual humility as the capacity to down-regulate self-oriented motives (e.g., goals to protect one’s self-esteem, based in a sense of high competence) in favor of a higher-order goal: the pursuit of reality (e.g., acknowledging the limits of one’s epistemic meta-competence). Thus, knowledge pursuit, in the modern world, requires the ability to shield epistemic aims (i.e., knowledge goals) from competing non-epistemic goals (e.g., self-esteem), requiring effective self-regulatory capacities and performance. Executive functions (i.e., working memory, cognitive flexibility, and inhibitory control) comprise the foundations of effective self-regulatory skills (Zelazo et al., 2016). Extending Ballantyne’s (2023) work, effective epistemic thinking requires not only the down-regulation of self-oriented motives but also the ability to inhibit the many

distractions and temptations found in technology-enhanced environments (Gupta & Irwin, 2016). Finally, knowledge pursuit often extends for long periods of time, frequently containing multiple discrete sessions of cognitive labor, with numerous false starts and stops. The ability to persist in such extended and sometimes frustrating knowledge pursuit taps people's volitional capacities and skills (i.e., self-control; Duckworth et al., 2019). Thus, in this poster, the epistemic thinking's relations with self-regulation will be modeled at multiple time scales, illustrating their mutual and dynamic interactions.

The shaping of epistemic ideals through rightful presence

Ravit Golan Duncan, Rishi Krishnamoorthy and Edna Tan

Common portrayals of science in classrooms, as well as the standards that drive them, espouse a normative Western view of science with its underlying neoliberal and technocratic ideologies (Gunckel & Tolbert, 2018). Given these ideologies, scientific progress is susceptible to overlooking possible harm caused in the process of attaining knowledge or through its outcomes (Harding, 2006). Historically marginalized communities have been particularly susceptible to harm from science research (Washington, 2019).

In science communities, shared epistemic (and ethical) norms determine what counts as worthwhile and sanctioned research. In science classrooms, knowledge building communities of learners can also decide on what counts as sanctioned and valued knowledge- what are the community's epistemic aims, ideals, and reliable processes. But what happens when the ideals and reliable processes espoused by a community of learners bump up against sanctioned (normative) ideals and reliable processes? What happens when concerns about the well-being of a marginalized community bump up against the desire to attain knowledge about it?

We present such a case in which 7th grade students developing a survey to find out what causes stress in their community of peers engaged in a discussion of whether or not to ask questions about known causes of stress that may themselves cause stress to, and thus harm, respondents. This discussion surfaced a tension, between an epistemic aim of finding out about the prevalence of stressors and an emerging ideal of care-for-respondents, in deciding about reliable processes for attaining the aim (i.e., what and how to ask about stressors). Prior to the lesson in which the survey was developed students shared experiences of stress and reviewed data showing that insufficient income was a prevalent cause of stress in the town, data to which students could relate.

Our analysis of the tensions that arose in discussions around the development of the survey draws on the *Rightful Presence* (RP) framework (Calabrese & Tan, 2020). The RP framework argues for the right of marginalized students to change the rules and expectation of the school science "game" as part of legitimate participation in it. Promoting rightful presence in classrooms entails making sociopolitical struggles visible in the classrooms as a legitimate form of participating in science, and places responsibility on those who hold power in these spaces (e.g., teachers) to leverage their positions, as sociopolitical allies, for change towards more just outcomes (Calabrese Barton & Tan, 2020). Using this lens, we critically examine how students negotiated their rightful presence by resisting reliable processes they deemed extractive and harmful, and advocating for an epistemic ideal of care in evaluating reliable processes—i.e., what and how to ask questions of the community.

This analysis illustrates the negotiations as students vied for which questions to include (and why) considering possible harm to respondents. Students explored alternative ways of phrasing questions and structuring the survey to get information about respondents' income level. The teachers and researchers facilitating this discussion played a role in affording or constraining student agency and rightful presence as they attempted to help students navigate the complex epistemic terrain. Ultimately, the class decided not to include a question about income. The loss of information about this variable was deemed, by the community of students as justified given the risk of harm. The prioritization of an ideal of care over competing ideals such as appropriateness and conclusiveness (Duncan et al, 2018) was an act of rightful presence- an instance of changing the normative rules of the (epistemic) game in favor of rules that protected their community from possible harm.

Reflective considerations: The theoretical and practical issues of applying the AIR framework in a social media context

Christiana Varda and Eleni A. Kyza

The three components of the AIR framework — Aims, Ideals, and Reliable epistemic processes — have been used as lenses to understand epistemic engagement during online evaluation, but not always in conjunction to each other. We extend this line of research to understand epistemic engagement in *a new context* (social media) and by adopting *a holistic approach*, considering all AIR components. Therefore, we ask: *What are the challenges of adopting a holistic approach to understand epistemic engagement in a social media context?*

We conducted a qualitative, exploratory study that examined the quality of epistemic engagement with an interactive social media post on a controversial topic via a think-aloud protocol. Participants (n=13; 18-25 years old) were presented with a simulated Twitter-like post. They could take actions on the post and could use the web as they wished; all actions were recorded, while think-alouds and interviews were transcribed verbatim.

We present theoretical and practical issues around two key areas: (1) identifying and (2) analyzing epistemic engagement holistically. For a holistic analysis, each of the AIR components needs to be clearly identified, but during fleeting encounters with information this may be challenging. The first challenge concerned identifying the participants' aims, as we cannot assume that they are completely verbalized or that we can always ascertain if they are epistemic. In addition, aims may change during engagement with a social media post; considering the temporal dimension can aid in detecting such shifts or the co-occurrence of aims. Distinguishing epistemic from non-epistemic ideals on social media was another challenge, especially when engagement was limited, or when there was reliance on heuristics. To identify epistemic processes in a social media context we examined behaviors, and developed a level-based taxonomy to capture the quality of epistemic engagement.

Another major challenge concerned how we qualified epistemic engagement on social media as successful. We created diagrammatic representations to map individual epistemic engagement trajectories (EETs), which included the AIR components and epistemic judgements by considering their interconnections. Deciphering the link between goals, ideals, actions and judgements posed an important challenge. We addressed this issue through iteratively contextualizing representations in the data, discussing and revising EET representations. We shifted representations from (1) cyclical, to (2) linear, temporal, and finally (3) schematic EETs of aims, ideals, processes and epistemic judgements to gain a holistic view of each participant's engagement with the post. The iterative design cycles made connections across AIR components more salient.

The issues raised are important to consider if the goals of epistemic education are to promote apt epistemic engagement (Barzilai & Chinn, 2018). Examining individual aspects of the AIR framework only provides us with a partial view of epistemic engagement, while a holistic approach affords considering these interconnections to examine what they mean for epistemic engagement on social media.

Epistemic dimensions of discourse in a knowledge building environment

Yuyao Tong and Carol K. K. Chan

Productive discourse engagement is an essential competency for students to succeed in diverse learning performance. Despite its importance, students face considerable challenges developing productive discourse in knowledge building. Substantial research efforts in learning sciences/CSCL have focused on developing productive discourse, yet little attention has been given to students' epistemic discourse understanding. We argued that students need to develop an epistemic discourse understanding to engage in productive discourse similar to the roles of scientific epistemology in scientific inquiry. How epistemic discourse understanding can be characterized as intersecting epistemic thinking and knowledge building has not been systemically investigated. This study adapted the Apt-AIR framework (Chinn et al., 2014) to assess and promote students' epistemic discourse understanding and engagement in a knowledge-building environment. Knowledge building is a CSCL model supported by Knowledge Forum, with students taking collective responsibility for advancing community knowledge (Scardamalia & Bereiter, 2014). We designed the learning environment augmented with meta-discourse which refers to students' epistemic and metacognitive reflection into their discourse in classroom talks. Students collectively reflected on online discussions beyond ideas/content involving inquiry into the epistemic dimensions of discourse, including aims, standards, and strategies (AIR) – they also considered what constitutes a good discourse, developing their epistemic criteria of knowledge building.

We examined the nature and role of epistemic discourse understanding in productive discourse in design-based studies with Grade 9/10 students studying Visual Arts. We constructed a scheme (Tong & Chan, 2023) to assess students interview responses integrating the epistemic dimensions of the AIR model (i.e., students' *aims* when engaging in discourse, the *standards* that students use in evaluating discourse, and what kinds of *strategies* to achieve the aims for productive discourse, Chinn et al., 2014) with three progressive modes/levels of discourse (i.e., knowledge-sharing, knowledge-construction and knowledge-building, van Aalst, 2009). As an example, some students may see the standards of productive discourse as mere exchange of information (sharing), while others view good discourse as meaning-making (construction) or advancing community's knowledge frontiers (knowledge-building/creation) and different epistemic thinking would influence their epistemic commitment. Our findings indicated students with more complex epistemic thinking about discourse engaged in deeper knowledge-building discourse. Qualitative analysis of classroom meta-discourse indicated the dynamics of how students' epistemic discourse understanding co-evolved with their epistemic engagement of productive discourse. Our study contributes to the epistemic cognition and knowledge-building literature by using the AIR model to

design an epistemic-orientated environment, characterize the epistemic dimensions of discourse, integrate AIR and knowledge building frameworks to provide an epistemic-based approach in promoting productive discourse.

Classroom communities' understanding of canonical scientific norms

Na'ama Av-Shalom

Recent educational standards such as—in the USA—the Next Generation Science Standards (NGSS, 2013), foreground the importance science practices in science education (Osborne, 2014). The NGSS identifies and unpacks eight science practices, highlighting the most important elements. For example, when *planning and carrying out investigations*, middle school students should be able to engage with “investigations that use multiple variables” and “identify independent and dependent variables and controls” (NGSS, 2013, p. 389).

These highlighted elements that specify the science practices can be thought of as the canonical norms of science—the aims, ideals, and reliable processes that scientists use as they engage in scientific practices. But what do students understand about these norms? Prior work has shown that students may not be guided only by canonical scientific norms, and often prioritize scientific norms differently from scientists (Hogan & Maglienti, 2001; Pierson et al., 2022). The goal of the NGSS is not that students should develop only procedural knowledge (e.g., how to conduct an investigation), but also that they should be supported to understand the epistemology of science (Osborne, 2014). Towards that end, it is important to explore what ideas about scientific norms classroom communities develop and how students can be supported to raise and explore their potentially diverging ideas towards building a shared understanding of scientific norms and their relevance to classroom science practice.

Drawing from a larger study, this work explores two cases in which middle school class communities discussed, over several months, two scientific norms highlighted in the NGSS, *controlling variables* and *critiquing*. I draw on the aspects of the Apt-AIR framework as a lens to investigate what ideas the classroom communities developed about these two scientific norms. In the analysis, I take a closer look at discussions in which different ideas about a norm emerged in classroom discourse, such as when a disagreement arose, to explore how the teacher provided—or missed—opportunities for students to work towards a shared understanding.

The results highlight that the class community's taken-as-shared understanding of norms may sometimes not, in fact, be shared, and that discussing epistemic norms across the components and aspects of the AIR and Apt-AIR frameworks can be a tool to surface and address these different understandings. In particular, class communities may discuss the cognitive and metacognitive aspects of scientific norms in ways that align with more canonical scientific understandings of the term. However, when prompted to discuss the adaptive, caring, and participatory aspects of those scientific norms, the students often voiced quite different ideas, that may have been overlooked without such prompting. This research offers a new lens for understanding the complex and varied ways that classroom communities engage with canonical scientific norms. The findings also support the value of using the Apt-AIR framework as a guide for how to create opportunities for classroom communities to discuss a wider variety of ideas about canonical scientific norms within the context of their classroom science practices.

Using Apt-AIR to guide the design and analysis of a socio-scientific unit

Huma Hussain-Abidi, Kyle Hunkar, Clark A. Chinn, Susan A. Yoon, Noora Noushad, and Zhitong Yang

Our project applies the Apt-AIR framework to guide the design of a high-school life sciences unit and to analyze the classroom discourse within the unit. The unit is a socio-scientific unit in which students investigate factors that mitigate an epidemic (Yoon et al., 2023). We designed the unit to address the challenges presented by the “post-truth” world, with rampant misinformation and science denial (Lewandowsky et al., 2023).

In designing the unit, we collaborated with teachers to define the aims, ideals, and processes that would form the learning objectives of the lesson. The core aim was developing accurate explanatory models as students conducted simulation-based experiments to determine how different mitigators such as masking and vaccinations reduced the spread of the disease and death from it. We decided to address a range of ideals for good models, including that models should *fit all the evidence*. We also focused on helping students develop a range of reliable processes, including good methodological processes for collecting and analyzing data (e.g., running sufficient trials in the simulation, conducting unconfounded experiments, and so on), as well as processes to guard against motivated reasoning such as taking alternative hypotheses seriously. We collaborated as a team to develop learning activities that engaged students in all five aspects of apt epistemic performance. Particularly important was the adaptive aspect: Throughout the lesson, teachers and students discussed how the ideals and processes that they were could be adapted for use to understand scientific matters outside of school.

In addition to using the Apt-AIR framework to guide the design of the unit, we have used it to guide our analyses of the classroom interactions, especially teacher moves, that emerged in the unit's activities. Because

our unit is designed to promote the use of appropriate aims, ideals, and processes along all five aspects of epistemic performance, we have examined whether the intended range of performances is expressed in classroom talk. For example, we examined the extent to which students and teachers addressed the ideal of “fit with all the evidence” in all five aspects of engagement. We also examined what kind of teacher moves students use to promote the use of this ideal. Similar procedures were used for all prominent aims, ideals, and processes.

Three key findings are: (1) Teachers engaged students in rich engagement—especially cognitive and metacognitive—with a good range of aims, ideals, and processes. (2) There was less adaptive engagement than had been expected—specifically, less discussion of how the aims, ideals, and processes used in class could be adapted for use outside of class than we had expected. (3) Teachers engaged students in productive metacognitive discussions in which appropriate aims, ideals, and processes were described and labeled (e.g., identifying fit with all the evidence as an important criterion for good models), but there were opportunities for more discussion of why these were valuable (e.g., explaining why it’s important to fit all the evidence, not just some of it).

In summary, we have advanced research on epistemic education by showing how the Apt-AIR framework can be used both to guide the design of units and the analysis of students’ and teachers’ performance during this unit. Our findings demonstrate considerable skill among teachers in leading these units, while also noting areas of improvement.

Experts’ adaptation of apt epistemic performance: The role of practical knowledge

Victor M. Deekens, Brian M. Cartiff and Jeffrey A. Greene

Today’s complex information environment, filled with misinformation and disinformation, requires individuals to make reliable judgments about complex topics demonstrating their apt epistemic performance (Barzilai & Chinn, 2018). Despite this need, it is not possible for a person to acquire the skills and knowledge usually deemed necessary to demonstrate apt epistemic performance in every domain. Inspired by this, Greene et al. (2021) found that experts in the natural and social sciences were able to adapt some aspects of their apt epistemic performance capacities in their own domain to a complex problem in another domain, psychology, but that this adaptation was not always competent, nor apt. Greene and colleagues called for additional research regarding what aspects of knowledge are needed to effectively adapt apt epistemic performance.

In response to Greene et al.’s (2021) call, and inspired by the aims, ideals, and processes elucidated in AIR and Apt-AIR, we continued their analysis of the adaptation of apt epistemic performance with a focus on if and how practical knowledge (i.e., knowledge built in practice and not from formal training; Hager, 2000) about a topic supports or hinders the adaptation of apt epistemic performance. We used in-vivo thematic analysis of think-aloud protocol data to capture the epistemic performance of nine university professors, three education experts, three natural scientists, and three other social scientists, as they navigated questions about a complex problem in education about which all had practical experience, teaching. We asked each participant to review four selected texts and make recommendations for a colleague considering the efficacy and potential use of flipped classroom pedagogy. We were interested in whether non-education experts’ practical knowledge would enhance their adaptation of apt epistemic performance allowing them to match that of the education experts.

We found similarities (e.g., overall conclusions) and differences (e.g., deeper analysis from in-domain education experts) between the groups as well as examples of adaptation of apt epistemic performance supported by practical knowledge when non-education experts answered questions about teaching. For example, non-education experts made valid suggestions about pedagogical choices based on their knowledge of the constraints a university teaching career imposes on professors including time availability and the tenure process. Failure to adapt apt epistemic performance also appeared including, most notably, natural scientists’ rejection of qualitative research as invalid when, in fact, the qualitative research could have added value to their thinking.

Overall, we found value in the AIR and Apt-AIR frameworks which provided the overall direction for the project. We utilized selected aspects of the Apt-AIR framework to focus on our unique interest in the role of practical knowledge on the adaptation of apt epistemic performance. Future iterations of AIR and Apt-AIR may be expanded to address differences in learner’s expertise and the role of practical knowledge in epistemic performance and its adaptation to other domains.

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