

TO: Charles Perfetti, Director of LRDC

FROM: LRDC Board of Visitors: Hilda Borko, Suzanne Donovan, Barry Fishman [Co-Chair], Susan Fitzpatrick, Art Graesser [Chair], Ping Li, Kenneth Pugh, and Colleen Seifert. Kathy Hirsh-Pasek, Danielle McNamara, and Nicole Patton-Terry were unable to attend the 2023 meeting but reviewed and responded to this report.

RE: LRDC Board of Visitors (BoV) Meeting, November 2-4, 2023

The BoV appreciated this opportunity to visit LRDC in person and learn more about its current programs of research, development, education, and mentorship. We appreciate the broad, interdisciplinary mission of the center, and the opportunities it creates for harnessing research to address problems of learning and instruction. We continue to be impressed with the breadth and quality of scholarship at LRDC and its success in producing unique contributions to the study of learning, human development, and schooling. This year also included many updates on issues raised in prior reports, offering significant improvements to maintain LRDC's position as a preeminent multidisciplinary center. Since the last visit, the evidence shows that LRDC has also deepened connections with and service to the academic mission of the University of Pittsburgh.

This report is organized into three sections: (1) Near-term decisions for the future of LRDC, (2) Center progress during the past five years, and (3) challenges and opportunities for LRDC's next five years.

1. Near-term decisions for the future of LRDC

The BoV noted three critical changes in the dynamic environment of research and education at the University of Pittsburgh that will impact the immediate and long-term planning for LRDC. First and foremost, Dr. Perfetti has announced his intention to step down from his position as Center Director at the end of the summer in 2024, necessitating a search for a new leader of LRDC. Second, there have been multiple changes in leadership in the University administration and in some units with strong ties to LRDC. There is an emerging conversation about how University of Pittsburgh research units and centers (including LRDC) may be reorganized in the future, with possible consolidation under the Vice-Chancellor for Research. And third, the introduction of a new budget model for University units will impact the future funding model at the Center. Immediate attention to these three changes is critical to LRDC as an internationally recognized Center that has been flourishing for almost 60 years at the University. We believe that these issues are related, and propose that they be addressed together.

As an interdisciplinary center that is focused on learning, the LRDC is uniquely positioned within the educational mission of the University of Pittsburgh. The work of LRDC has proven valuable to

the University in its academic, educational, research, and outreach missions, as evidenced in its active undergraduate research program and recent LRDC engagements in student interventions for belongingness and inclusiveness in University STEM departments. These projects create use-inspired basic research on learning environments while addressing immediate concerns in University classrooms. To leverage the strengths of the Center for the larger mission of the University, a close relationship and direct reporting to the Office of the Provost is essential. The BoV strongly supports a continued reporting relationship between LRDC and the Office of the Provost. The great success and history of LRDC clearly set it apart from other centers, and its centrality to the educational mission of the University make it an invaluable partner in the changing dynamics of higher education.

Maintaining the partnership between LRDC and the Office of the Provost will also be central in the successful recruitment of a new director to lead LRDC into its next horizon. As a member of the Dean's Council, the head of LRDC is able to coordinate projects and priorities to align with other academic units. Given that many LRDC faculty and researchers hold different joint appointments between units, including the LRDC Director on the Council is crucial for successful administration of these units. Having the Director in the room with other key decision makers avoids misunderstandings, minimizes conflicts in time and resource allocation, and maximizes emerging opportunities for collaboration. We believe that recruiting an outstanding new leader for LRDC will depend on maintaining a reporting relationship directly to the Provost.

Finally, moving to a new budget model presents challenges to organizations as people and units learn to consider their work, expenditures, and revenue flows in new ways. We believe the Provost's new budget model represents an opportunity to recognize contributions from LRDC across the university. Some important University programs, such as the new *Learning Sciences* Transcript Distinction, are not currently funded as revenue for the Center. Direct negotiations with the Provost about annual budget allocations allows strategic expansion of the university's mission. We also note that LRDC has never had direct support through the University's Development Office activities. Given the upcoming 60th anniversary of the LRDC, the time is right to establish this University of Pittsburgh resource to develop relationships with donors who are concerned about improving learning outcomes.

2. Progress Over the Last Five Years

The BoV was uniformly impressed with the breadth, depth, and novelty of the research highlighted at the November, 2023 meeting. LRDC members presented many of their projects in child learning and development, university student and instructor learning, learner motivation and engagement, neuroscience of learning, and the role of technology and generative AI in education. These were not only important scientific contributions, but were also relevant to challenges faced in schools, universities, and society. The BoV noted the progress LRDC has made since the BoV met in

person 5 years ago, despite the unique uncertainties created by COVID. LRDC maintained and in some cases increased its stellar publication and funding records during challenging times.

In addition to LRDC's success in science, scholarship, and funding, LRDC has made some remarkable, if not landmark, progress in other dimensions of the center's scope. Some of these efforts align with prior feedback from the BoV, whereas others newly emerged from LRDC's adaptation to a rapidly changing world. We address several of these important contributions below.

Communication and Website

Communication with students, universities, school systems, funding agencies, researchers, and the community is essential for any center with the international visibility of LRDC. During the last five years, there have been major improvements in disseminating the research and practices of LRDC through more avenues. This includes a vastly improved LRDC website and the newsletter that is sent to researchers and practitioners throughout the world. The website provides succinct and engaging descriptions of projects, faculty, staff, and activities – with pictures, Powerpoint presentations, and other engaging media.

Generative Artificial Intelligence

Generative AI has had a transformative (what technology folks call “disruptive”) impact on education, industry, and citizens. Instructors throughout the world are uncertain how ChatGPT, DALL-E, and other AI technologies can be integrated with current educational activities. LRDC has already conducted illuminating research on this technology-education integration. LRDC is well situated to address this challenge through its distinctive, if not unique, interdisciplinary collaborations between researchers in education, the learning sciences, computer science (including computational linguistics and AI), psychology, and other fields including law and economics. Many universities do not have in place such a distinguished group of researchers who collaborate across these areas and that have extraordinary expertise in the cognitive, developmental, and social processes that underlie learning technologies. Thus, LRDC is poised to serve as a “hub” of research activity that provides guidance on how to integrate generative AI into classrooms with an evidence-based foundation in learning sciences and deep expertise in the underlying technologies. LRDC is highly visible throughout the world for its expertise across educational settings, developmental trajectories, learning sciences, and cognitive models of instruction in addition to computational and technological developments in instruction. LRDC is encouraged to strengthen partnerships with other institutions (including Carnegie Mellon University) and industries to examine learning in this new era of AI.

Connections to Undergraduate Education and Expanding Diversity

Undergraduate education is, of course, a core mission of the University of Pittsburgh. LRDC has stepped up to initiate new programs aimed at including undergraduate students in the academic study of the learning sciences. They have partnered with the University Center for Teaching and

Learning to launch a University Certificate on learning science and now offer a course providing engagement with many Center researchers. Their mentorship of undergraduate students completing research projects in the science of learning provide experiential learning about research methods through state-of-the-art projects. The reported impact on students identifies this effort as a valuable contribution to undergraduate education at the University.

In addition, LRDC has successfully launched a summer internship program aimed at students from marginalized and first-generation groups. The BoV was extremely impressed with the quality and effort reflected in this program. Interns receive intensive support to join research projects as novices assisted by researchers, staff, and students throughout the Center; their welfare is centered in the choices and guidance of the program director. The success of this program suggests that it is a model for other University groups. It could be expanded to local University of Pittsburgh and community college students to enhance LRDC's many efforts to increase diversity among its researchers, staff, and students.

Research on Academic Engagement and Motivation

College students will not learn if they are not engaged through course activities, relationships, and teamwork to motivate their expending effort in the face of difficult subject matters to master. For example, the experiences across universities that have launched MOOCs (Massively Open Online Courses) show that instructional delivery is not enough to avoid extremely high attrition over even short time frames. In addition, traditional approaches to higher education in STEM have demonstrated biases and inequities that limit the success of women and marginalized groups. LRDC has undertaken multiple projects aimed to track and improve student engagement in STEM courses and promote the success of all students. Currently, these include enhancing students' feelings of belongingness in STEM fields, addressing issues of personal identity and well-being, and preparing students to expect difficulty and failure as part of college learning. Field research (even on campus) raises many challenges, but the LRDC has built strong relationships with departments and educators to test interventions at the University of Pittsburgh.

Internal Awards Program

LRDC's Internal Award program has had a substantial impact in stimulating important interdisciplinary projects that frequently lead to external funding. There is a return-on-investment rate of 6:1 for every dollar invested in this program. High-quality Interdisciplinary research projects are very difficult to launch because researchers are prone to pursue their own very active agenda. The Internal Award program successfully provides the needed infrastructure to guide and incentivize novel interdisciplinary research collaborations. The LRDC culture and this Internal Award program is clearly successful as a mechanism for incubating interdisciplinary research projects that move on to competitive outside funding programs.

Graduate Student and Postdoctoral Researcher Programs

Feedback from graduate students and postdocs in LRDC was very positive. They expressed high morale for their work in the Center. They were excited by exposure to high quality research, interdisciplinary efforts, opportunities for conference funding, and access to accomplished researchers. Graduate students expressed high satisfaction with Center and department involvements, reporting a seamless integration with department programs and curricula. The challenges of cross-unit work environments appear to be quite successful for those engaged in research training at LRDC.

3. Challenges and Opportunities for the Next Five Years

The BoV identified a number of challenges and opportunities that LRDC may consider in strategic planning for the future. We see these as important to consider for further growth at LRDC, the University of Pittsburgh, the research and school communities, and beyond.

New Synergies Between Existing Focus Areas

Even more synergy among LRDC's funded projects may be possible and desirable. LRDC has been successful in establishing projects that assemble researchers from different fields – an advantage over the more siloed work that is common within departments. However, the BoV observed that, even with the interdisciplinarity that exists within projects, existing projects within LRDC sometimes drift into their own silos. For example, efforts to increase synergy between existing projects may deepen connections between human cognitive neuroscience and the learning sciences in LRDC. LRDC's significant expertise in human cognitive neuroscience may benefit the learning sciences across projects and themes; given the significant work with school children and teachers, LRDC colleagues could consider integrating neuroplasticity studies within the school context. These do not necessarily need to involve expensive equipment or large-scale and time-consuming studies, but could be conducted with current mobile technologies with EEG and fNIR tools. Such studies could provide data that informs educational practice in addition to new theoretical understanding and insights about the cognitive neuroscience of learning. Such efforts would also align well with current trends in human neuroscience that examine naturalistic neuroimaging measures and adopt ecologically valid paradigms to make neuroscience more relevant to human communication and education in the real world.

Another initiative to enhance synergy may establish regular events where researchers from the various projects present their contributions to others within LRDC. It would be important to establish a norm by which even those with busy schedules have a presence at these community research events. The postdoctoral researchers, in particular, expressed an interest in a communal structure to provide opportunities to learn about LRDC projects and build a shared understanding of LRDC's mission. Perhaps these local project presentations might be mixed with notable external speakers and workshops on new methodologies and approaches. Many of the graduate

students, research staff, and researchers expressed interest in a Center forum for becoming acquainted with colleagues as a regular part of their LRDC activities. These activities can also have an outward-facing component by recording talks to stream on the website, helping to advertise work-in-progress, connect students to projects, and build a shared vision of LRDC.

Connections Between The Institute for Learning and the Center

The Institute for Learning (IfL) is the only separate institute within LRDC, perhaps because it provides materials and services to education systems on a contractual basis. During the time since its founding, there has been a shift in the field of education toward a bi-directional, reciprocal relationship between research and practice. In this important evolving endeavor, practice becomes a source of new theory and spurs basic and classroom research. The resulting research findings help frame and contribute solutions to problems in practice. We observed that the relationship between IfL and LRDC does not yet reflect a shift to this bi-directional model. However, a small number of faculty are collaborating with IfL which creates pathways for future reciprocal practice and research partnerships. We recommend that LRDC encourage intentional development of IfL and its members to broaden its scope towards integrated research and practice in a deliberate fashion.

Challenges for the Research Associate Role

The Research Associates (RAs) varied in their views of the position. Several of them greatly appreciate the flexibility the position offers to maintain the connections to LRDC while they pursue independent projects. A few others who were interested in longer term careers at LRDC had concerns about their career trajectories and connections with LRDC beyond their specific project with a Principal Investigator (PI). No RA expressed concern about their PI or project but spoke about developing career connections at LRDC beyond their current work. It may well be the case that LRDC would benefit from better integrating RAs into the structure of the Center by leveraging their skills and contributions with LRDC activities in order to promote flexibility for career development. Resources could be allocated to have a percentage of their time involved with important LRDC initiatives. For example, teaching, service, and mentoring may be identified and recognized as contributions to the Center's success beyond their employment title.

In general, these scholars are looking for opportunities to contribute to the Center and to advance their career development as researchers. Center-based efforts to integrate RAs can add to individual PI mentorship to benefit both scholars and LRDC. Their contributions may include organizing Center-wide workshops on methods, statistics, and technology, career development guidance from campus resources, and participation in practice conference and job talks. These connections with LRDC will increase the visibility of junior scholars at all stages, including graduate students and postdocs.

Challenges Presented by the New Budget Model

The BoV heard mostly encouraging things about the new University budget model from LRDC staff, although we note there are some challenges that may arise as well as opportunities to leverage. Plans to split indirect cost recovery from research grants between LRDC and academic units promote equity and fairness, as long as they follow funding agency requirements that funding follows effort. It is also important that LRDC ends up with important funds needed for key internal activities. The change in the Provost's budget model requires discussions of central support for currently unfunded activities with the Provost, such as course offerings, undergraduate student research roles, and mentoring associated with the *Learning Sciences* Transcript Distinction. These contributions cannot be funded through research grants so they need support from the Provost. LRDC is a key partner to multiple academic units as it contributes to the success of students as well as faculty research. This partnership structure between multiple departments and the Center underscores the importance of LRDC reporting directly to the Office of the Provost.

Finding the Next Director of LRDC

Hiring a new director for organizations like LRDC is never easy. LRDC has had only three leaders over its nearly 60-year existence which raises the stakes significantly. An ideal candidate will have the ability to make sense of the different research areas across LRDC, envision how they fit together, and integrate them in the mission to improve the science and practice of learning and education. A director of LRDC also needs to understand the governance and political structures in a complex R1 university, as well as the organizations and politics in the surrounding community, state, and nation. Because of LRDC's global connections, familiarity with leading centers of research on learning around the world is also needed. A director's credentials as a top scholar with experience in funded research projects must be evident so the director is a respected peer among senior faculty and leaders across the University of Pittsburgh. While qualified candidates for this role may be available within LRDC, we encourage the University to conduct a national search for its next director. Such a search confers legitimacy on the selected director, whether that person is an external or internal candidate. The BoV members are willing to provide consultations about the search should the University consider this helpful.

In closing, the BoV was impressed with the progress made by LRDC during the last 5 years during the difficult COVID era and movement to a new building. LRDC is healthy and growing. We also have identified some challenges and opportunities to increase its momentum.