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MULTIPLE MEASURES & INTERDISCIPLINARY ADVENTURES: BENCHMARKING INTERDISCIPLINARY ASSESSMENT DESIGN IN THE CREATIVE ARTS AND HUMANITIES

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These papers offer background reading and information for users of the Multiple Measures online tool and website, www.multiplemeasures.org.au.

For further detail, or with any questions including citation advice, please contact the authors, listed above.

ABSTRACT:

Multiple Measures is an Innovation and Development research project funded by the Australian Government Office for Learning and Teaching. Developing the competencies of next-generation practitioners to address the so called 'wicked problems' of our time, is a research challenge, requiring new paradigms and approaches to pedagogy. (Klein 2006; Connor 2011; Mulder 2012). The project draws on Boix Mansilla and Dawes Duraisingh's analysis of quality interdisciplinary (ID) work, including the degree to which it is 'grounded in disciplinary insights, advances student understanding through integration, and exhibits critical awareness'. (2007, p 222).

This paper focuses on three themes developed through the project that are central to the informed consideration and design of ID pedagogy and assessment. These themes are investigated through six pairs of questions, focussing on **Students** (What level of expertise will students bring to their learning? What expectations of learning cultures will students bring to the cohort?); **Learning Outcomes** (How important is it to develop students' own disciplinary practice/s through ID activity? How important is development of students' abilities to work with others from different disciplines / industries?); and **Pedagogy** (How actively involved are students in the development of the direction, focus or aims of the project? Is the process for resolving or delivering a project designed by the student/s or directed by staff?). Themes and questions are used for filtering examples, evaluating their approach, and benchmarking for further development.

This extensive, multi-institutional investigation has collected rich data and examples from across Australian creative arts and humanities courses to focus on the assessment practices that frame, elicit and inform students' ID understanding. The refinement of the themes and questions and their inclusion in the tool has been strongly informed by educators' contributions to workshops and interviews. This paper offers a brief overview of the project with a focus on the questions developed, and their central role in the consideration interdisciplinary education through the Multiple Measures tool.

KEYWORDS: Interdisciplinary, assessment design, benchmarking, innovation

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INTRODUCTION

This paper will present **Multiple Measures**, an Innovation and Development research project funded by the Australian Government Office for Learning and Teaching. The project focused on the delivery of interdisciplinary (ID) education in the creative arts and humanities. It has been developed to support enhancement of good ID assessment approaches through a focus on good pedagogy design and the selection of precedent references that can inform its further development. The completed project has collected detailed examples from across Australia, making these available via a bespoke online tool. The project has built upon these examples to identify and develop core ID themes, and to develop benchmark parameters with guidelines for their application. These three themes and their development and application are the focus of this paper.

The Multiple Measures project, formally titled *Benchmarking Interdisciplinary Assessment tasks in the Creative Arts + Humanities*, focused on interdisciplinary (ID) activities and learning and teaching innovations from undergraduate to Masters levels across the creative arts and humanities. The project brought together learned colleagues with strong records in education for creative disciplines and drew on the expertise from across Australia, and internationally via the Reference Group.

The project aimed to:

- identify objectives and core values of interdisciplinary approaches by reviewing current engagements, goals and ambitions;
- contribute to a shared understanding of ID assessment standards;
- enhance the ability of staff to develop, articulate and apply assessment approaches and criteria for ID tasks;
- improve the equitable comparison of ID outcomes across institutions.

A comprehensive series of workshops over the two-year project formed a key forum for its development and refinement, and included events in Melbourne, Sydney, Adelaide and Canberra. This series concluded with a workshop and the Australian launch of the website at Monash University in Melbourne in June 2016. Dissemination activities have included a presentation at the Design Research Society International Conference 2016, at the University of Brighton, UK.

MULTIPLE MEASURES – EXPLORING A LIBRARY OF APPROACHES

The Multiple Measures (MM) website, multiplemeasures.org.au, hosts the interactive tool developed through the project. The tool delivers a rich searchable library of ID units/courses/subjects and supports a user to identify relevant examples to inform his/her own design of ID assessment. At the time of writing, the library includes summaries of more than forty-five interdisciplinary teaching engagements collected from across Australia. These “MM Summaries” were developed on the basis of interviews, collected documents, and sample student submissions.

Users of the website can filter the MM library using the three MM themes, or via keywords. Themes are expressed in the tool as three sets of paired questions or filters, focusing on Students; Learning Outcomes; and Pedagogy. This approach aims to support educators

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already delivering ID content through benchmarking, as well as those who are designing new ID experiences for students.

The library is designed to grow. A user can submit examples of his/her ID teaching with suggested coding for the six filters. The website also collects anonymous data about searches and outcomes with a view to further extension of this research focus on ID pedagogy and assessment design.

MM QUESTIONS – DEVELOPING THE APPROACH

Initial drafts of the MM questions were developed on the basis of literature review, and tested against practitioner surveys and interviews, and submitted materials. The Multiple Measures workshops became very valuable events in the development of project definitions and approaches, the refinement of MM themes and their application in the search approach. Participants in the workshops were engaged educators with recent experience in the delivery of ID education, and have formed a valuable community of practice able to offer considerable experience and key insights to the project.

Workshops were hosted by Australian National University (Canberra, April 2015); Victorian College of the Arts at the University of Melbourne (Melbourne, June 2015); University of South Australia as part of ACUADS (Adelaide, September 2015); University of NSW Art & Design (Sydney, Feb 2016). Early workshops sought participant responses to provocations in the form of discussion papers or unit/subject/course outlines, as well as ‘provocateurs’ with expertise in assessment. Participants in later workshops, including an ACUADS 2015 roundtable, tested drafts of themes and filter questions and early summaries of assessment approaches, and also tested beta versions of the online tool. Testing, critique and feedback was crucial to further development of these. Other formal meetings assisted further development of this thinking at UNSW Art & Design; University of Tasmania; Monash University.

As the filters and approach were refined, each MM Summary was coded according to the questions by the project team, using a consensus approach. Coding was an iterative undertaking, reviewed and refined for the early summaries as the questions, their conceptualization and their expression were further developed. Coding of each summary was further reviewed at the conclusion of the project and during the development of benchmarking statements.

MM QUESTIONS – FILTERING OF THE LIBRARY

In the final version of the Multiple Measures online tool, a series of buttons and sliders allow a user to filter the contents of the library (<http://multiplemeasures.org.au/tool/>). In this way, s/he can use the MM questions to identify precedent references most relevant to his/her own approach to ID teaching. The filter questions most relevant to a user’s concerns can be used as indicated in the diagram below. The search can also be made by keyword, or it can be unfiltered, accessing the entire library at once.

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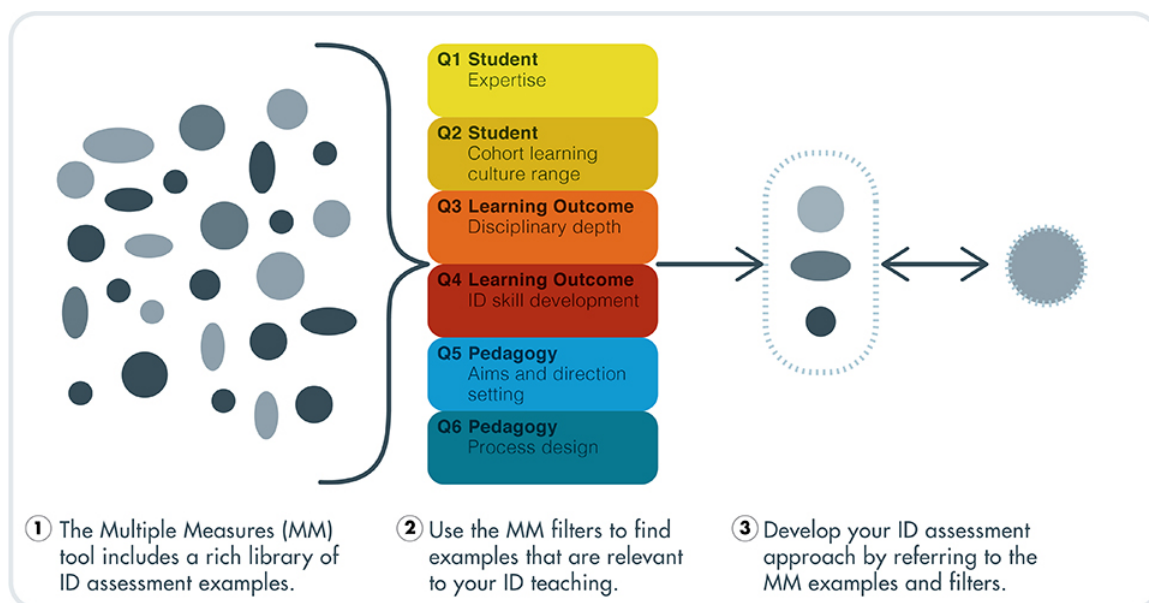


Fig 1 : Using the MM Filter Questions to search the MM Library

It is important to note that the mode of interaction for users of the MM tool highlights the range and potential combination of responses. These paired questions are not considered mutually exclusive, eg. educators need not choose between learning outcomes that focus on disciplinary depth or ID skill development. With the exception of Question One (which has multiple 'radio buttons'), responses are collected via 'sliders' on a continuum. Question two is a two-ended slider, allowing the user to identify the scope and focus of an identified range as below. Other questions are single sliders.

1
What level of expertise will students bring to their learning?
[More information Background notes PDF](#)

Year 1 Year 2 Year 3 Honours Masters

2
What expectations will students have of the learning culture? Use the two sliders below to show the range and style of learning expectations across the cohort.
[More information Background notes PDF](#)

Low Consensus Disciplines Middle Point High Consensus Disciplines

Fig 2 : Using the MM Filter Questions to search the MM Library, examples of filters Q1 and 2

MM QUESTIONS – DETAILS AND DISCUSSION

Background to the questions, framed by relevant literature, is provided for users via popups and PDFs on the tool. Together, the three themes (and six filters) outline an epistemology of interdisciplinary educational practice that can inform and extend ID pedagogy and research in its response to the global concerns of the twenty-first century. These notes form the basis for the discussion of these themes in the sections below.

Students - Questions One and Two

What level of expertise will students bring to their learning?

Are students reliant on external resources or advice for knowledge or have they moved toward discovery and self-authorship in their studies (Hodge et al., 2008)? Although this may not take into account the individual experience of all students or differences between faculties or institutions, the year level(s) of the students can establish an approximation of expertise.

What range of expectations will students have of the learning culture?

The student cohort may include students with different ways of engaging with content. Are students accustomed to receiving knowledge as information from educators, and is that knowledge hierarchical and cumulative (usual in 'hard/abstract' or 'high consensus' disciplines)? By contrast, are students more likely to engage in independent interpretation and construction of knowledge with tutor support (usual in 'soft/concrete' or 'low consensus' disciplines)? (Biglan, 1973a, 1973b; Kolb, 1981). This question asks teachers to consider the range of difference across the cohort.

In questions 1-2 the focus is on students, the levels of expertise they may bring to planned interdisciplinary engagements, and the significance of their disciplinary and cultural backgrounds to the development of new interdisciplinary studies. Despite some limitations the project used year level as a key summary measure for Q1. Some researchers have suggested a linear expertise progression from novice, to advanced beginner, and to competent (Dreyfus & Dreyfus, 2005). This presents some key problems in the discussion of 'innovative' approaches to ID engagement! A more holistic view of expertise in the creative disciplines, however, embraces personal development dimensions and engagement skills commonly valued in studio-based learning and teaching (de la Harpe & Peterson, 2008).

Students' expertise and maturity are also prominent concerns in inquiry-based approaches to learning (Healey & Jenkins, 2015; Hodge et al., 2008), which complement and inform the design of many interdisciplinary engagements. The 'Student as Scholar' model (Hodge et al., 2008), for example, foregrounds 'frame of mind' – motivation, belief in the possibility of original scholarly and creative work, and self-perception in relation to peers – in order to achieve self-authorship of new knowledge.

The significance of students' disciplines of origin may be considered in relation to this, and can be productively understood via Biglan's (1973a; 1973b) enduring classification of discipline paradigms along three continuums: hard/soft, pure/applied and life/non-life. Across disciplines, the degree of consensus about the theories and methods varies from high to low.

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Students in the 'low paradigm' arts ('soft-applied'), for example, are considered more likely to engage in earlier, independent knowledge construction than peers in 'high paradigm' mathematics and chemistry ('hard-pure') (Robertson & Blackler, 2006).

A complementary view of disciplines and students' associated learning strategies – abstract or concrete – persists from Kolb's (1981) index of academic fields. In this index, mathematics is classified as abstract, and the humanities concrete. The abstract-concrete continuum suggests a need for mediating strategies where students come together to work on interdisciplinary tasks. In contemporary contexts, the relevance of these models is borne out in the distinctive ways of working by students from different disciplines (Bailey, 2010). In many cases today, students will be negotiating both disciplinary and cultural difference in interdisciplinary engagements.

This pair of questions considers the expertise, viewed holistically, that students bring to an interdisciplinary engagement. The questions challenge educators to develop awareness of diverse student backgrounds and expectations, and to identify learning opportunities and mediating strategies in that context.

Learning Outcomes - Questions Three & Four

How important is it that each student develops his/her own disciplinary practice/s through this ID activity?

An interdisciplinary approach fostering critical thinking and practical problem solving encourages students to develop their independent practice (Mafe & Webb, 2009). Exposure to other ways of working can allow students to develop more sophisticated responses (Bhana, 2010).

How important is it that each student develops skills and abilities to work with others from different disciplines/industries through this ID activity?

The product or outcome produced by students can be treated as the means to develop interdisciplinary engagement skills. In this approach assessment may focus on collaborative, entrepreneurial and presentation skills, or the ability of students to find a common language and deal with ambiguity (Bailey, 2010; Boix Mansilla, 2005; McPeck & Morthland, 2010).

AQF Level 7 highlights the value of ID activities stating that students graduating from a Bachelor's degree are expected to have a "broad and coherent theoretical and technical knowledge with depth in one or more disciplines or areas of practice" (Australian Qualifications Framework, 2013, p. 47). This values development of a "T-shaped individual" such that graduates "have deep knowledge of one subject (the down stroke of the 'T') and broad experience and understanding of other disciplines (the cross-stroke)" (Leonard-Barton, 1995 in Bailey, 2010).

The appropriate balance between depth and breadth may be contingent on the students' stage of learning and personal development (see question 1 above). At the early stages of an undergraduate degree it may be more appropriate to focus on skills that enable students to increase disciplinary depth, such as research skills, and the use of technologies

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appropriate to the discipline (de la Harpe & Peterson, 2008; Mafe & Webb, 2009). ID studies highlighting disciplinary depth may be more suitable at such a stage.

Disciplinary depth helps to form the cognitive maps ('paradigms') and vocabularies necessary to both disciplinary and interdisciplinary studies (Davies & Devlin, 2010). Confidence in one's disciplinary grounding is also considered important for successful interdisciplinary engagement (Bailey, 2010; Boix Mansilla, 2005). By Master's level, graduates are expected to have already developed depth, or "expert, specialised cognitive and technical skills in a body of knowledge or practice" (Australian Qualifications Framework, 2013, p. 59). At this level, developing skills for interdisciplinary engagement may be motivated by goals of increasing students' employability – skills such as communication, teamwork and problem-solving (see <http://www.assuringgraduatecapabilities.com/> for examples of graduate capabilities and their support and encouragement according to discipline).

This pair of questions asks the education designer to consider the emphasis between disciplinary depth and interdisciplinary breadth. Are the learning outcomes from the course going to help the students perform better in their own disciplinary practice (depth)? Or is the emphasis on gaining skills and knowledge that will enable further interdisciplinary engagement (breadth)? Most courses will be aiming to foster a mix of these outcomes, but will reflect a stronger desire to achieve one or the other, independent 'sliders' allow educators to consider these agendas separately.

Pedagogy - Questions Five and Six

How involved are students in deciding the brief, direction or aims of the assessment task/s?

Will students respond to a defined question / inquiry defined by the teacher that can be answered through the knowledge of the discipline or are they defining their own question, determining how that question might be answered and in turn contributing to/building knowledge of the discipline (Levy, 2009; Levy & Petrulis, 2012). Where will the students' work fit between these extremes?

Is the process for developing or delivering assessment task/s designed by the students or directed by staff?

In the early stages of learning there may be greater emphasis on the development and assessment of process, depending on discipline culture (de la Harpe & Peterson, 2008; Krukauskas & Ward-Perkins, 2014; Winters, 2011).

These questions focus on the role of students (and educators) in setting the focus or brief for an assessment task, and in decision making as it is undertaken. Factors including choice, self direction, the disciplinary backgrounds of students, and opportunities for meta-learning development are discussed in relation to four modes of inquiry-based learning that resonate with creative arts and design education. The extent to which students or staff direct the project brief or inquiry is relevant in relation to the graduate expectations set out for Level 7 of the Australian Qualification Framework (AQF) (2013). In their application of skills and knowledge, students are expected to conduct self-directed work and demonstrate autonomy

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and judgment.

Progression toward these graduate outcomes may be supported by application of four modes of inquiry-based learning – identifying, pursuing, producing and authoring (Levy & Petrulis, 2012). This model offers the potential to move students from a teacher-framed inquiry with significant process support, toward taking responsibility for determining how they will respond to their own questions, and increasingly provide independent process support as peers approaching professional practice. The personal dimensions of this progression toward ‘authoring’ intersect with the ‘Student as Scholar’ model (Hodge et al., 2008) discussed above.

Designing for process support by both teaching staff and peers is another important factor in interdisciplinary learning activities and assessment tasks. The diverse disciplinary backgrounds of students in interdisciplinary engagements (see Q2) is likely to manifest along the process-application/outcome continuum discussed in Q6. Arguably, creative arts and design students whose courses typically demand early self-reflection, inquiry, group work and collaboration skills (Robertson & Blackler, 2006; Winters, 2011) may be well-placed to develop and provide support as part of their meta-learning skills development.

This pair of questions asks the designer of an interdisciplinary course to consider the level of direction students are assigned in framing their project focus or inquiry, and equally how their self-direction, judgment and autonomy are developed within the learning process. The MM examples discussed highlight how self-direction and process support are expressed through learning outcomes and assessment criteria, and whether these align with the intention of the course if it is considered in terms of process-application or outcome.

MM QUESTIONS – BENCHMARKING REFERENCES and DESIGN DEVELOPMENT

A central aim of the Multiple Measures project is provision of support for educators to develop new ID engagements, informed by current practice. Benchmarking, a formal process of establishing relative performance through the systematic comparison of some aspect of an example with that of other relevant ‘partners’ offered a useful mechanism. This can be distinguished from the ‘absolute’ response to defined threshold standards, offering scope to focus on design development through the reference to rich comparators. Recent audits of tertiary institutions have proposed benchmarking as a suitable framework for quality assurance and quality improvement activities (Henderson-Smart et al, p 146). Selection of benchmarking partners is a central concern of benchmarking. (Epper, 1999).

The six filters developed through the project form the basis for self-benchmarking and subsequent development of interdisciplinary assessment approaches in two respects. First, they assist an educator to identify benchmarking ‘partners’ that are relevant to his/her own concerns and intentions, and second, they form reference points to consider further development of the ID assessment design.



Fig 2 : An MM summary example, graphically indicating the coding of the ID education in terms of the 6 MM filter questions, and a timeline of assessment tasks and criteria (see key below)

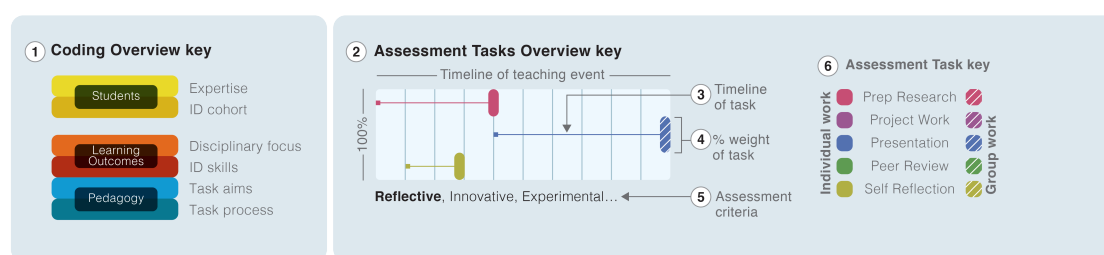


Fig 3 : The MM Coding Overview key and Assessment Tasks Overview key.

After a user has applied filters to the library, a short-list of MM summaries allows 'benchmarking partners' to be selected. Each summary includes the outline and intentions for the unit/course/subject, with diagrammatic representations of coding against the six filters, a timeline of assessment tasks and criteria. (see Figs 2 and 3 above).

A user can select up to three benchmarking 'partners' to inform the benchmarking of his/her own approach. An online template provides space to review the delivered or developing unit/subject/course in this context. The user is asked to describe his/her current approach, and to consider the assessment design in terms of the MM filter questions. Guidelines for Questions One and Two highlight the need to 'tailor' teaching to the needs of an ID cohort (in terms of expertise and of learning expectations within the cohort mix). Questions Three and Four, and Five and Six, ask educators to consider the alignment of the pedagogic approach with the intended Learning Outcomes (Biggs & Tang, 2007). Each MM summary (including those selected for benchmarking), has notes considering these aspects of the assessment approach. The tool presents the user with a graphic reminder of his/her slider responses to compare these intentions with the selected 'benchmarking partners'.

How well does your assessment design fit the ID cohort?
[More Information](#) [Download background notes.pdf](#)

Does it fit the level of student expertise?
[More information](#) [Background notes PDF](#)

Does it respond to the range and style of cohort learning expectations?
[More information](#) [Background notes PDF](#)

Your slider responses

Fig 4 : A section of the benchmarking template, showing space for user responses, and a reminder of his/her initial slider responses via the six questions.

At the conclusion of the benchmarking template, there is space to record plans for further development of the assessment design. These notes can be downloaded as a PDF report, including a user's notes and comments, graphic representations of his/her slider selections, and full MM summaries and supporting materials. The package brings together all of the applications of the six filters, providing a summary of the educator's key concerns, alongside examples of others' responses to matching concerns, and his/her review of the relevance and opportunities of these for further development of the ID assessment design.

CONCLUSION

This paper has set out the central role of six filter questions to the framing and application of the Multiple Measures tool for the benchmarking and design of ID education and assessment. These filters focus on Students; Learning Outcomes; and Pedagogy in approaches to ID education, and have been informed by literature review, field research, and examples collected from across Australia as part of this Australian Government Office for Learning and Teaching funded project. The contributions of a large number of educators, forming a growing community of practice who participated in workshops over the two-year project have been invaluable to the development, testing and refinement of the tool and website. The application of the learning from this exercise, will also be enabled through their ongoing engagement. The major outcome of the project, the library collection, continues to grow. It makes use of the six questions, themselves a useful outcome of the project, as filters, measures and challenges. Together, these comprise a new approach to self-benchmarking applied to assessment design through the Multiple Measures tool.

The research also offers scope for extension beyond that of the original project, including examples from international institutions, as well as from a wider field and differing mix of disciplines. Members of the research team are currently investigating the application of this approach to course/program design. Further exploration of the filters is the subject of forthcoming papers, as is a review of ID education models uncovered.

Developing interdisciplinary approaches aims to enable the practitioners and researchers of tomorrow. Developing good pedagogical and assessment practices at this frontier is critical to its further expansion, as well as to informing the skills and self-assessment of decision-makers who will engage with the future's challenges. The Multiple Measures project offers a new and informed perspective on the value of the creative disciplines in general, and art and design pedagogy in particular. It highlights the value effective interdisciplinary learning experiences can offer to those who must frame and address the complex challenges on our horizon.

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The Multiple Measures project has brought together a number of colleagues with strong records in education for creative disciplines and a focus on interdisciplinarity. It has investigated subtle and varied experiences of ID education, and has sought to deliver these in a form that can support and inform best practice as well as pedagogic innovation.

The project has benefited from the contributions of many people, particularly those who offered their time and energy to workshops and other discussions over eighteen months, and who have communicated in between these in an ongoing conversation about value and possibility. Thank you!

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