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SoTL in Process

The Use of Learning Contracts as Potential Equity Blueprints in Undergraduate Research Mentorship

ABSTRACT

It is well known that high quality Undergraduate Research (UR) mentoring leads to better outcomes for faculty and students. In recent years, interest in the best practices faculty use for mentoring has increased. One pedagogical tool that has not received a lot of investigation is the use of Learning Contracts (LCs) within undergraduate research and how they might provide an equity-minded lens to this teaching context. We present initial insights from our colleagues on their current use of LCs in UR, as a starting point for thinking about how we can better support UR mentoring in ways that are inclusive to both mentees and mentors.

KEYWORDS

undergraduate research, learning contracts, equity-minded teaching, mentorship

INTRODUCTION

Undergraduate research (UR) is known to be a high impact practice (Kuh 2008) and is one way faculty engage in teaching beyond the classroom. UR experiences offer a myriad of benefits for students and faculty who participate (Campbell 2022; Laursen, Hunter, Seymour, Thiry, and Melton 2010). For example, UR ". . . not only helps students learn in their disciplines; it also helps them develop a variety of skills valuable in their futures" (Campbell 2022, 13). These gains include development of: intellectual and relationship skills, collaboration, confidence, and career planning and preparation. Campbell also states that faculty benefit from UR mentoring because it enhances their teaching, stimulates research, helps integrate research and teaching, and increases job satisfaction, making UR a practice beneficial and meaningful to both student and faculty.

To help students and faculty have successful UR experiences, high quality mentoring is crucial (Vandermaas-Peeler, Miller, and Moore 2018; Walkington, Hall, and Ketcham 2022; Walkington, Stewart, Hall, Ackley, and Shanahan 2020), and something which many faculty are not intentionally trained to do. A useful framework to help deliver high quality UR mentoring and to support faculty in developing best practices for this form of teaching is the salient practice framework (Shanahan, Ackley-Holbrook, Hall, Stewart, and Walkington 2015; Walkington et al. 2020, 2022). This framework lays out 10 distinct practices that can be used as guidelines for UR mentoring. However, there are other pedagogical tools that may center students as partners in these salient practices that support faculty in UR, such as the use of Learning Contracts (LCs, Box 1) (Baker, McCaffrey, and Manning 2022; Mabrouk 2003). LCs offer faculty a guided approach to integrating the salient practices into their UR mentorship as their use requires strategic pre-planning (salient practice 1), setting clear and well-scaffolded expectations (salient practice 2), and teaching technical skills and ethics (salient practice 3). While this might seem like common practice, little scholarship and resources explores how faculty

One of the first things created for a new course is the syllabus where faculty describe the course, discuss how evaluation will occur, and set general guidelines of behaviors and expectations. However, despite calls for syllabi creation to be more inclusive and to keep with the learner in mind (Addy, Dube, Mitchell, and SoRelle 2023), generally these are usually created without much input from the learner and are unidirectional decisions made by the faculty onto the experience of the student. A more inclusive and partner-focused approach are LCs which may help students take more control of their learning. Anderson, Boud, and Sampson (2014) write,

> a **learning contract is a negotiated agreement** [emphasis added] based upon both the learning needs of the individual undertaking the contract as well as the formal requirements of the course or institution involved. It is a plan of action as much as a statement of expected outcomes. Its value lies in its relevance and application to the needs of the learner. (4)

The ethos of LCs seems to fall in line with the teaching pedagogy of co-creation to help bolster student learning, offering a more equity-focused approach that invites the student to have agency in deciding the learning that will occur.

think about LCs in the context of UR and how this type of non-classroom teaching might require different considerations to LC use.

The UR mentoring relationship often starts with the mentor driving the work of the project, and LCs may be a tool to help create a pathway into incorporating student involvement from the onset. The use of equity-minded approaches to teaching and mentoring UR is a growing area of inquiry, but to date, there is still a gap in tangible practices that faculty can use within their UR mentorship. Explicitly integrating equity-minded practices into UR mentorship can help create environments where students feel more agency, respect, and partnership with their UR mentor, enhancing the experience and outcomes for both students and mentors (Lawrie et al. 2017; Stentiford and Koutsouris 2021). Given the nature of LCs as a mechanism that:

> . . . supports individualized student learning by allowing the student the opportunity to structure the working relationship so it best meets the student's own unique learning needs. It also provides the student with an opportunity to define what they need from their faculty mentor in order for meaningful learning and research productivity to occur. (Anderson et al. 2013, 29)

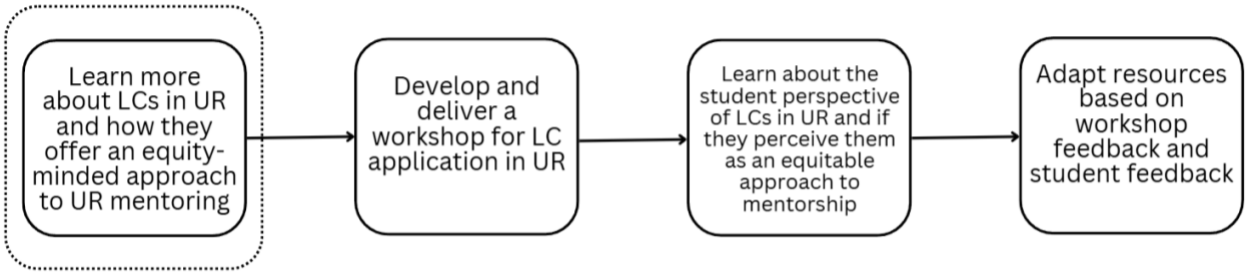
While UR is framed within a mentorship model, not all partnerships will be guided with an inclusive and equity mindset. LCs offer mentors a structured pedagogical tool to implement the salient practices of UR while also framing the mentor-mentee relationship through a student as partners lens, which may lead to more inclusive and equitable experiences (Cook-Sather, Addy, DeVault, and Litvitskiy 2021; O'Shea 2018; Walkington et al. 2022).

Our inquiry process

To explore the use of LCs as an equity-minded approach in UR, we are engaging in a multi-step inquiry process that seeks feedback from mentors and mentees, while also developing and delivering

support to our UR mentor colleagues. Here, we present initial insight from UR mentors on their use of LCs in UR and how they consider it to be a potentially equity-minded approach (Figure 1).

Figure 1. Map of our inquiry stages



Gaining insight from our colleagues

Faculty who self-identified as UR mentors completed a short exploratory survey asking about their use of LC in UR mentoring and how LCs can be used as a tool for equity-minded teaching. Questions included, "What items may be included in a learning contract for undergraduate research mentoring" with a list of options including, but not limited to, the definition of undergraduate research, learning outcomes, and assessment process. We pulled these items from the literature on learning contracts and from what we identified as the commonly used components in UR. We then asked the mentors to identify which components were easy or difficult to develop and incorporate into LCs. Open-ended questions inquired about their own use of LCs in the UR experience, what challenges they experienced when using LCs, their perceptions of how LCs support UR learning, and how equitable practices could be integrated into the development of LCs for UR.

We recruited participants through snowball advertising in professional groups associated with UR mentoring (e.g., The Center for Engaged Learning Summer Seminars) and open invitations on well-established North American teaching listservs (e.g., Professional and Organizational Development Network). We chose these listservs given the diversity of subscribers (e.g., faculty, educational developers) across disciplines and their use in previous scholarship (e.g., Green and Little 2016; Kolomitro and Anstey 2017).

Data was analysed using Microsoft Excel and SPSS, with descriptives used to explore quantitative data, and descriptive content analysis for qualitative data. We initially scanned and coded inductively open-ended responses (Elo, Kääriäinen, Kanste, Pölkki, Utriainen, and Kyngäs 2014; Huberman, Miles, and Saldana 2014). One reviewer analyzed all data initially and developed codes appearing across questions. To enhance trustworthiness and reliability, an additional reviewer went through the data to confirm codes and themes. When we found discrepancies, all reviewers discussed and agreed on any adjustments.

FINDINGS

Fifty participants (Table 1) completed the survey. These participants were predominantly female (n = 35; 70%), associate professors (n = 27; 54%), in STEM (n = 19; 38%), and at teaching-focused universities (n = 46; 92%). Thirty-five (70%) stated using LCs or syllabus when mentoring UR.

Table 1. Sample demographics

Demographics	Count (%)
Gender	
Female	35 (70%)
Male	13 (26%)
Other	2 (4%)
Title/Rank at your Institution	
Assistant professor	10 (20%)
Associate professor	27 (54%)
Professor	11 (22%)
Lecturer	1 (2%)
Adjunct	1 (2%)
Discipline	
STEM	18 (36%)
Humanities	10 (20%)
Social sciences	9 (18%)
Education	3 (6%)
Health sciences	3 (6%)
Business	2 (4%)
Other or not listed	3 (6%)
Focus of Job	
Teaching	46 (92%)
Research	4 (8%)

When asked what they include in UR LCs (Table 2), the top five responses were expectations for students (n = 35; 100%), project timelines (n =29; 83%), learning objectives/outcomes (n =27; 77%); and expectations of mentor and assessment process (n = 26; 74% for each).

To better understand how to help mentors design LCs, we asked participants to rate which parts they found easy and difficult to develop. The top five parts rated as easiest included: 1) expectations of students (n = 31); 2) expectations of mentor (n = 24); 3) learning objectives and description of project (n = 22, each); and 4) timeline and grading scheme (n = 21 each). The top five rated as most difficult included: 1) assessment process and timeline (n = 12 each); 2) learning objectives (n = 8); 3) description of project (n=6); and 4) grading scheme (n = 5). Interestingly, participants identified four parts as both the easiest and most difficult to develop (e.g., learning objectives/outcomes, timeline, grading scheme, and description of project), perhaps suggesting these areas are important to target for mentor support. This may reflect the different stages that mentors are in with their research projects and where students are in developing the necessary skills for UR. It could also be related to the individual experiences of the mentors or disciplinary differences.

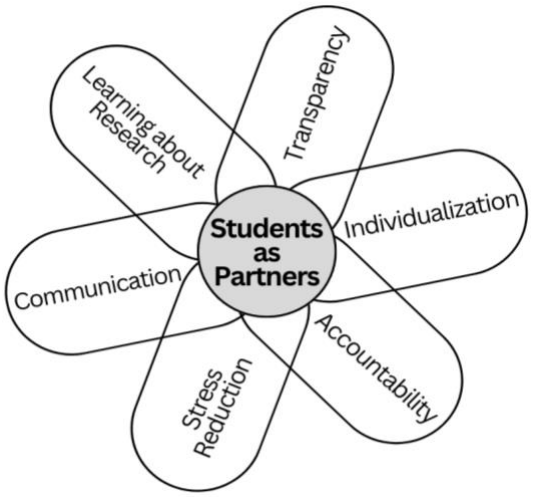
Table 2. Components included in learning contracts/syllabi of research mentors

Item	Number who include (n = 35)
Expectations of student	35 (100%)
Timeline	29 (83%)
Learning objectives/outcomes	27 (77%)
Expectations of mentor	26 (74%)
Assessment process	26 (74%)
Description of project	24 (69%)
Grading scheme	23 (66%)
Code of conduct/statement of professionalism	15 (43%)
Plagiarism information	10 (29%)
Mentoring/teaching philosophy	4 (11%)
Other	3 (9%)
Definition of undergraduate research	0 (0%)

A conceptual model for the design of LCs in UR

Six major themes emerged about current uses of LCs in UR mentorship. These offer pillars for grounding practices when constructing LCs with students (Figure 2).

Figure 2. Conceptual framework for the development of LCs in the UR context



Learning about the research process

While none of the participants include a definition of UR into their LCs (Table 2), many integrate the process of inquiry, not in context of UR, more broadly into their LCs in order to ". . . give the students an appropriate roadmap to help them see how each step of their research process fits into the larger whole. It defines what 'successful' research looks like." This might indicate the need for more opportunities for mentors to intentionally develop their UR mentorship philosophy and discover how best to support student learning in this context, reflecting both on how the goals of UR inform what pedagogical approaches mentors take, but also how their own experiences of UR mentorship might inform their overall teaching philosophy. From a student perspective, explicitly articulating what disciplinary inquiry involves and how it overlaps or differs from UR can help frame the learning experience for the mentee and inform/impact the other practices outlined below.

Individualization

Given the often one-on-one nature of UR mentoring, participants found it important to take into account the student's overall academic, personal, and career goals when planning and conceptualizing the UR experience in the LC. For example, one participant noted that an important approach when developing an LC is to "have students identify which possible aspects of research experiences (from a list) they are most interested [in] given their future goals. The specifics of their research experience is then tailored to fit their goals and my minimum requirements." In addition to individualized goals, some felt it was important to incorporate and articulate positionality, particularly their student's, into the plan for question development and study design:

> We craft our data collection in a way that honors their positionality, and I present myself as an open and welcoming support system for them. While I think these things are implied, I could make an effort to more clearly articulate these ideas into the syllabus, especially since it [is] one of the first things we do as a team.

The use of LCs, rather than a syllabus, allows mentees and mentors to develop a plan of inquiry that best meets their combined goals, rather than only the project's goals as determined by the mentor.

Transparency

The use of LC in UR makes the often-hidden curriculum and culture, particularly for labs or research groups, visible to students who are novices in this area and may be new to learning in non-classroom spaces. As one respondent noted:

> The contract itself is my way of being inclusive in that I used to just make it up as I went along, and this lack of transparency and fairness was problematic. Having the contract makes sure that I am treating students equitably and being as clear as possible.

For many, transparency overlapped with the other themes, making expectations clear and providing equitable experiences across mentees while centering learning through the use of a LC. This transparency may be even more important for students who are from historically marginalized populations or first-generation students who may not have the agency, confidence, or tools to navigate the UR experience (Pierszalowski, Bouwma-Gearhart, and Marlow 2021; Stephens, Fryberg, Markus, Johnson, Covarrubias 2012).

Accountability

While LCs can offer transparency of expectations to learners, they can also provide transparent ways to ensure accountability for both the mentee and mentor. For example, "I intend to start using a learning contract/syllabus, because I think it will help both me and the student develop clear goals, hold ourselves accountable, and delineate clear expectations. This could mitigate future issues by providing a physical entity to refer back to at a later date, if necessary." Articulating ways in which the mentee and mentor can expect each other to be accountable, how both will track that accountability, and also how each will respond to issues of accountability can help both mentee and mentor navigate the UR mentoring relationship and uncover the often-hidden curriculum and expectations for students.

Communication

Participants articulated two communication benefits of LCs: 1) that clear and transparent expectations, deadlines, and work norms were co-agreed upon and co-stated in order to be upfront about expectations and responsibilities, which reduces any potential conflict or misinterpretations; and 2) that when this is done through intentional discussion and negotiation, the LC can integrate both the mentor and mentees' voice; "I endeavor to make this a discursive, dialogic process—mentees and I find our way together to the words written down in the syllabus/plan/contract." This shared communication and agreement differs from a syllabus which is through the faculty perspective and voice. Instead, LCs work to center the student's perspective into the development of the project and to determine the shared working environment and expectations together.

Stress reduction

Through the use of LCs, and the integration of the other themes, many participants noted that students experienced less stress and anxiety related to how they were being assessed, as the LC focused on the process of learning rather than the outcome. As one respondent noted, "I find grading is less a stress-inducing item in UR experiences/courses (compared to regular courses), I can see the benefit of moving away from regular grading practice in highlighting the significance of learning." By integrating the other themes in the conceptual framework, LCs have the opportunity to remove some of the ambiguity of the UR experience for students, centering UR as a process rather than a product of inquiry.

Students as partners

Throughout all themes, participants expressed an appreciation for partnering with students throughout the LC development. For example,

> I believe 100% that students should be full partners in developing the learning contracts/syllabi. The research project should give the students ownership, so all elements of the contract should be discussed and agreed upon by all partners—student and faculty.

Most participants felt that co-creating the LC with students and addressing these themes in partnership was both inclusive and equity-minded; "I design my contracts with my student(s), so as to center inclusivity and equity as well as student ownership." While we believe that LCs are naturally a student-centered practice, participants found the partnership of co-creation was particularly important and relevant.

Implications LC construction in UR

The conceptual framework we present here offers six themes to ground practical approaches to LC construction for the UR context and through an equity-lens. One area of further development is the consideration of supporting mentors with the use of adaptable standardized components, which may help reduce the workload of creating multiple LCs while also helping ensure mentors and mentees obtain the goals of UR. A "plug-and-play" model could allow for mentors to begin conversations with their mentees around the six themes, allowing for individualization of LC components, while also ensuring consistent experiences across mentees. For example, one colleague suggested:

> I think it would be helpful to develop each contract individually, to give each student a chance to voice their own suggestions/concerns without fear of judgement from peers. This could encourage greater freedom of expression. I would also plan to have a few items directly related to inclusion and equity in my back pocket to suggest if they didn't come up in discussion naturally, which we could use as a launching off point to discuss at greater length.

We believe these standardized components could include:

- an explicit definition of UR with appreciation of unique institutional goals;
- agreed upon learning outcomes that (i) reflect the scope and definition of UR and (ii) are connected to transferable skills beyond the research process that the learner would like to build (e.g., time management, project management, etc.);
- an outline of the research process in full and what part of that process will be accomplished within the UR experience;
- an expected timeline with space for flexibility for when "the unexpected" happens;
- agreed upon expectations of working hours, deadlines and timeline, professional development plans and goals, and process and timeline of feedback and integration of feedback into work; and
- intentional language around equal partnership and responsibility between mentee and mentor to embrace the students-as-partner ethos.

CONCLUSION

Several respondents outwardly articulated that equity-minded teaching was not relevant when developing LCs for UR. These individuals reported this approach would likely ". . . look more out of place or be virtue signalling given the type of research we do. . . ." or that "these items seem irrelevant to me for the types of research projects that I mentor." While disciplinary context has often been a reason to push back against equity-minded approaches in teaching, we would argue that in the UR context, where relationships are at the forefront of the experience, these approaches are important, regardless of what you are studying. We recognize that our sample is limited in several ways: (a) participants are largely from teaching-focused institutions, (b) there is a small breadth of disciplines, and (c) a majority of participants identify as female. These characteristics are likely to impact the generalizability of the use of LCs as an equity-minded approach in UR. Regardless of these limitation, we hope that through the conceptual framework, colleagues can find pathways into co-collaborating and intentionally partnering with student mentees, embracing the themes that can ground that partnership and continue to explore how pedagogical approaches and tools, such as LCs, can be used as a means for more inclusive practices in UR.

AUTHOR BIOGRAPHIES

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ETHICS

Elon University's ethics review board deemed this research exempt.

REFERENCES

Addy, Tracie M., Derek Dube, Khadijah A. Mitchell, and Mallory SoRelle. 2023. *What Inclusive Instructors Do: Principles and Practices for Excellence in College Teaching*. Taylor & Francis.

Anderson, Geoff, David Boud, and Jane Sampson. 2014. *Learning Contracts: A Practical Guide*. Routledge. https://doi.org/10.4324/9781315041766.

Baker, Vicki L., Vanessa McCaffrey, and Caroline EN Manning. 2022. "Fostering Professional Development through Undergraduate Research: Supporting Faculty Mentors and Student Researchers." *Mentoring & Tutoring: Partnership in Learning* 30 (2): 216–34. https://doi.org/10.1080/13611267.2022.2057097.

Campbell, Wm E. 2022. "The Power of Undergraduate Research." In *Undergraduate Research in Online, Virtual, and Hybrid Courses*, 9–22. Routledge.

Cook-Sather, Alison, Tracie M. Addy, Anna DeVault, and Nicole Litvitskiy. 2021. "Where Are the Students in Efforts for Inclusive Excellence? Two Approaches to Positioning Students as Critical Partners for Inclusive Pedagogical Practices." *To Improve the Academy: A Journal of Educational Development* 40 (1). https://doi.org/10.3998/tia.961.

Elo, Satu, Maria Kääriäinen, Outi Kanste, Tarja Pölkki, Kati Utriainen, and Helvi Kyngäs. 2014. "Qualitative Content Analysis: A Focus on Trustworthiness." *SAGE Open* 4 (1). https://doi.org/10.1177/2158244014522633.

Green, David A., and Deandra Little. 2016. "Family Portrait: A Profile of Educational Developers around the World." *International Journal for Academic Development* 21 (2): 135–50. https://doi.org/10.1080/1360144X.2015.1046875.

Huberman, A. Michael, Mattew B. Miles, and Johnny Saldana. 2014. *Qualitative Data Analysis a Methods Sourcebook*. 3rd ed. SAGE Publications.

Kolomitro, Klodiana, and Lauren M. Anstey. 2017. "A Survey on Evaluation Practices in Teaching and Learning Centres." *International Journal for Academic Development* 22 (3): 186–98. https://doi.org/10.1080/1360144X.2017.1313162.

Kuh, George D. 2008. "High-Impact Educational Practices." *Peer Review* 10 (4): 30–31. https://dgmg81phhvh63.cloudfront.net/content/user-photos/Publications/PDFs/E-HIGHIMP.pdf.

Laursen, Sandra, Anne-Barrie Hunter, Elaine Seymour, Heather Thiry, and Ginger Melton. 2010. *Undergraduate Research in the Sciences: Engaging Students in Real Science*. John Wiley & Sons.

Lawrie, Gwen, Elizabeth Marquis, Eddie Fuller, Tara Newman, Mei Qui, Milton Nomikoudis, Frits Roelofs, Lianne van Dam. 2017. "Moving towards Inclusive Learning and Teaching: A Synthesis of Recent Literature." *Teaching & Learning Inquiry* 5 (1) : 9–21. https://doi.org/10.20343/teachlearninqu.5.1.3.

Mabrouk, Patricia A. 2003. "Research Learning Contracts: a Useful Tool for Facilitating Successful Undergraduate Research Experiences." *CUR Quarterly* 21: 26–30.

O'Shea, Sarah. 2018. "Equity and Students as Partners: The Importance of Inclusive Relationships." *International Journal for Students as Partners* 2 (2): 16–20.

Pierszalowski, Sophie, Jana Bouwma-Gearhart, and Lindsay Marlow. 2021. "A Systematic Review of Barriers to Accessing Undergraduate Research for STEM Students: Problematizing Under-Researched Factors for Students of Color." *Social Sciences* 10 (9): 328. https://doi.org/10.3390/socsci10090328.

Shanahan, Jenny O., Elizabeth Ackley-Holbrook, Eric Hall, Kearsley Stewart, and Helen Walkington. 2015. "Ten Salient Practices of Undergraduate Research Mentors: A Review of the Literature." *Mentoring & Tutoring: Partnership in Learning* 23 (5): 359–76. https://doi.org/10.1080/13611267.2015.1126162.

Stentiford, Lauren, and George Koutsouris. 2021. "What Are Inclusive Pedagogies in Higher Education? A Systematic Scoping Review." *Studies in Higher Education* 46 (11): 2245–61.

Stephens, Nicole M., Stephanie A. Fryberg, Hazel R. Markus, Camille S. Johnson, Rebecca Covarrubias. 2012. "Unseen Disadvantage: How American Universities' Focus on Independence Undermines the Academic Performance of First-Generation College Students." *Journal of Personality and Social Psychology* 102 (6): 1178. https://doi.org/10.1037/a0027143.

Vandermaas-Peeler, Maureen, Paul C. Miller, and Jessie L. Moore, editors. 2018. *Excellence in Mentoring Undergraduate Research*. Council on Undergraduate Research.

Walkington, Helen, Eric E. Hall, and Caroline J. Ketcham. 2022. "Mentoring in Undergraduate Research: The Teacher's Role." In *The Cambridge Handbook of Undergraduate Research*, edited by Angela Brew, Dominique Galli, Elizabeth Ambos, Harald A. Mieg, and Judith Lehmann, 133–48. Cambridge University Press. https://doi.org/10.1017/9781108869508.019.

Walkington, Helen, Kearsley A. Stewart, Eric E. Hall, Elizabeth Ackley, and Jenny Olin Shanahan. 2020. "Salient Practices of Award-Winning Undergraduate Research Mentors—Balancing Freedom and Control to Achieve Excellence." *Studies in Higher Education* 45 (7): 1519–32. https://doi.org/10.1080/03075079.2019.1637838.