



ISLS Annual Meeting 2022

Hiroshima, Japan, June 6 – 10

Workshops: May 30 – June 5

International Conference Center Hiroshima (Online Event)

**International Collaboration
toward Educational Innovation for All:
Overarching Research, Development, and Practices**

- ICLS Proceedings -

16th International Conference of the Learning Sciences (ICLS) 2022

Clark Chinn, Edna Tan, Carol Chan, & Yael Kali



Photo courtesy of Hiroshima Convention & Visitors Bureau



Wallace

公益財団法人 広島観光コンベンションビューロー
Hiroshima Convention & Visitors Bureau



National University Corporation
Shizuoka University

SENSHU UNIVERSITY



広島大学
HIROSHIMA UNIVERSITY

ISLS Annual Meeting 2022

*International Collaboration toward
Educational Innovation for All: Overarching
Research, Development, and Practices*

Hiroshima, Japan, June 6 – 10
Workshops: May 30 – June 5
International Conference Center Hiroshima
(Online Event)

16th International Conference of the Learning Sciences (ICLS) 2022

- ICLS Proceedings -

2nd Annual Meeting of
the International Society of the Learning Sciences
(ISLS)

Editors:
Clark Chinn, Edna Tan, Carol Chan, & Yael Kali

ISLS Annual Meeting 2022

*International Collaboration toward Educational Innovation for All: Overarching Research,
Development, and Practices*

Hiroshima, Japan, June 6-10

Workshops: May 30-June 5

International Conference Center Hiroshima (Online Event)

© 2022 International Society of the Learning Sciences, Inc. [ISLS]. Rights reserved.



www.isls.org

ISBN: 978-1-7373306-5-3 (ICLS2022 Proceedings, PDF Version)

ISSN: 1573-4552

Cite as: Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.). (2022). *Proceedings of the 16th International Conference of the Learning Sciences - ICLS 2022*. Hiroshima, Japan: International Society of the Learning Sciences.

All rights reserved. Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear the copyright notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior written permission of the International Society of the Learning Sciences. The International Society of the Learning Sciences is not responsible for the use which might be made of the information contained in this book.

Conference logo design by Cornelia Robrahn C74 Gestaltung & Design: <https://c74.org/>

How Higher Education Instructors Conceptualize Diversity: A Phenomenographic Study

Nicole A. Suarez, Song Wang, Stacey Brydges, Stanley M. Lo
nasuarez@ucsd.edu, sow004@ucsd.edu, sbrydges@ucsd.edu, smlo@ucsd.edu
University of California San Diego

Abstract: Higher education institutions around the globe have increasingly made the commitment to diversity. Instructors play an integral role in creating inclusive learning environments. Guided by sociopolitical perspectives on learning, we ask: How do higher education instructors conceptualize diversity? How do these conceptions inform curriculum and instruction? Interview data from 30 instructors teaching at minority-serving institutions in the United States revealed three distinct conceptions of diversity defined by variations in five aspects: student identities, intelligence mindset, pedagogical motivation, learning environment, and legitimized membership. The essentialist conception is based on students having inherently determinate traits described by preexisting universal categories. The functionalist conception differentiates students by academic performance. The existentialist conception acknowledges that students have unique experiences that impact the learning process. Our results indicate that while instructors acknowledge different student features and have varying understanding for why diversity is important, some conceptions of diversity do not necessarily suggest an inclusive culture.

Introduction

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has called for higher education institutions around the world to make the commitment to diversity. In an effort to promote inclusion and equity within education systems around the world, UNESCO (2020) called for the recognition and support of all learners who are diverse in “race, social class, ethnicity, religion, gender, sexual orientation, migrant status, and ability” (p. 24). Instructors serve an important role in the diffusion of diversity efforts through their design and implementation of transformed curriculum and cultivation of equitable teaching and learning environments (Kezar et al, 2008). Building the capabilities of and commitment from instructors to do this work often comes in the form of professional development (PD) (Macdonald et al., 2019). Though positive outcomes from such initiatives have been observed (Booker et al., 2016; Dewsbury & Brame, 2019), research continues to document chilly classroom climates and students’ negative experiences (Harrison & Tanner, 2018; Suárez-Orozco et al., 2015). A reason for such inconsistencies may be the assumption that instructor participation in PD programs is the solution to improving classroom climate. Professional learning does not take place in a vacuum, and the usual focus of PD programs on instructor teaching practices overlooks the importance of the meaning instructors ascribe to student diversity (Amundsen & Wilson, 2012).

The need to investigate how instructors conceptualize diversity rests on the assumption that how one conceives of the world informs the approaches they take and the practices they employ (Pratt, 1992). Previous literature has demonstrated that instructors’ conceptions of teaching are likely aligned with the approaches they adopt and the practices they implement; thus, any changes in conceptions will lead to observable changes in approaches and practice (Ho et al., 2001). Empirical research spanning decades has reported on different approaches and practices instructors have used in response to student diversity. Three pedagogical approaches have been broadly described: (a) the *ignore* approach, where instructors do not respond to student diversity; (b) the *compensate* approach, where instructors accommodate for students’ diversity; and (c) the *utilize* approach, where instructors recognize student diversity as an enhancement to the learning environment (Boelens, 2018; Gordon et al., 2010). The most notable practice described in the literature is microaggressions (e.g. derogatory statements and invalidations (Sue et al., 2007)) perpetrated by instructors towards students. These often racial and gendered comments are a main contributing factor to the unwelcoming climate experienced by students in higher education (Harrison & Tanner, 2018). There still remains a dearth of literature on how instructors conceptualize diversity. Previous publications have discussed diversity as conceptualized through group and individual differences (Gordon, 2010; Jokikokko, 2005) or through external attributes and invisible characteristics (Jokikokko, 2005). Yet, there is also a lack of studies who attempt to connect conceptions of diversity and instructor approaches and practices. Leveraging the newfound traction and discourse surrounding critical consciousness (Freire, 1970) and the social and political ways of understanding education, teaching, and learning

(Barton & Tan, 2020; González & Moll, 2002; Gutiérrez, 2013; Yosso, 2005), we sought to answer the following research questions: (a) how do instructors conceptualize diversity in higher education? and (b) how do these conceptions inform curriculum and instruction?

Conceptual framework

Phenomenography focuses on the qualitatively different ways that individuals experience, understand, and think about the same phenomenon (Marton, 1981). It is a common theoretical orientation used when examining conceptions (Åkerlind, 2005). The aim of phenomenography is to identify a range of conceptions, rather than describe correct or incorrect ways of thinking (Marton, 1981). Because conceptions are internal constructs, a phenomenon is assumed to be inseparable from an individual's experience. Therefore, phenomenography adopts a subjectivist and relative view of the nature of knowledge, where internal knowledge such as conceptions is dependent on the external reality and ultimately created through human thinking and activity (Svennson, 1997).

This relational nature between conceptions and reality means that a conception, when expressed, emphasizes parts of reality that have been more deeply experienced and thought about by an individual (Lamb et al., 2011). A fundamental assumption of phenomenography is that while conceptions holistically represent characteristics of a phenomenon, they can also be described compartmentally in terms of their reduced parts (Svennson, 1997). These reduced parts represent specific features of the phenomenon and are known as aspects (Marton & Booth, 1997). Variation theory within phenomenography further formalizes such awareness and relationship into an outcome space, which organizes the set of descriptions that are logically related to one another and reveals the distinctive ways in which individuals conceptualize a phenomenon (Marton et al., 2004).

Methods

Participants

Our study was conducted across multiple two-year and four-year minority-serving institutions (MSI) in California, United States. The instructors who served as participants were recruited from three PD programs. All instructors in our study engaged in their respective PD programs for at least one year. While this convenience sample through the PD programs was likely not representative of faculty at large in higher education, the sampling was also purposeful for the following reasons (Patton, 1990). Instructors who teach at MSIs are more likely to have interacted extensively with students from diverse backgrounds in their classrooms. The instructors also sought support and resources to develop pedagogical knowledge and improve their instructional practices. These specific contextual factors potentially provide information-rich experiences in relation to the phenomenon of diversity.

The sample included 30 instructors: 16 were full-time faculty at four-year MSIs, eight were part-time faculty at four-year MSIs, and six were full-time faculty at two-year MSIs. In terms of racial and ethnic backgrounds, 19 instructors identified as White or Caucasian; five as Hispanic, Latina/o/x, or Chicana/o/x; two as Asian or Asian American; two with multiple racial and ethnic identities; and two unknown. In terms of gender, 17 instructors identified as women, 12 as men, and one unknown. In terms of disciplines, 19 instructors were in the natural sciences, eight in the humanities, and three in the social sciences. Each instructor taught a range of courses with a variety in class size and subject matter within their respective disciplines. The inclusion of instructors from different institution types and disciplines provides a more complete sample to draw from in making the outcome space, leading to informative and robust findings.

Data collection and analysis

Instructors were interviewed using a semi-structured protocol designed to explore their conceptions of diversity in relation to teaching and learning in the classroom. The semi-structured interview format allowed instructors the freedom to expand their views while maintaining a focus (Bernard, 1988). Interviews lasted approximately 60 minutes each, and the protocol consisted of six main questions: (1) When you hear the word diversity in relation to higher education, what comes to mind? (2) Was there ever a time in your academic career when you thought about diversity in a different way? How did you think about diversity then? (3) Are there other words that your campus or department use to describe ideas related to diversity? (4) Does student diversity influence how you teach? (5) Does student diversity influence how your students learn? (6) What do students who excel in your course or discipline have in common? What do students who are struggling in your course or discipline have in common? Interviews were audio-recorded, transcribed verbatim, and de-identified before analysis.

The analytical process was organized into three steps. First, two members of the research team developed preliminary codes using content summary forms and close readings of the transcripts. Conceptual labels were created to describe what each instructor appeared to be attending to when discussing their experiences. At this

time, the research team consisting of all four authors also drew parallels between ideas identified in the interviews and existing constructs in the literature. This comparison served as an iterative process in which the investigative findings influenced the literature reviewed by the researchers, which in turn informed the refinement of data analysis. Second, these initial codes were transformed into conceptual categories by drawing relationships among the different aspects and variations emerging from the data. A constant comparative method (Glaser & Strauss, 1967) was employed to compare descriptions and definitions for each category with those from previously analyzed transcripts. This allowed for the confirmation or disconfirmation of previous conjectures, the guarding against biases, and the maintenance of consistency. Finally, data for each aspect were revisited to further refine and delineate the outcome space, resulting in different conceptions of diversity held by the instructors.

Our research team consisted of diverse perspectives including different nationalities and varying intersections of race, ethnicity, and gender. We used a process of argumentation at all three stages of the analytical process (Schoenfeld, 1992) to come to a consensus regarding the development of the codes, aspects, conceptions, and outcome space. Any disagreements were debated and fully resolved in research team meetings. Engagement in this activity provided a check against personal biases and aided with reliability. Åkerlind (2005) described this process as dialogic reliability in phenomenography, where researchers reach agreement “through discussion and mutual critique of the data and of each researcher’s interpretive hypotheses” (p.331).

Findings

Instructors in this study attended to five aspects when conceptualizing diversity: (a) student identities, (b) intelligence mindset, (c) student engagement, (d) pedagogical motivation, and (e) legitimized membership. Based on the variations within each of these aspects, we identified three qualitatively distinct conceptions. The first conception maintains a focus on fixed qualities about groups of students and standards for higher education. Borrowing from the field of philosophy, we term the first conception *essentialist*, as essentialism defines the nature of entities in the world by a set of immutable traits. The second conception centers on student achievement, with students divorced from their context. We call the second conception *functionalist* because the functionalism ideology in philosophy asserts that entities in the world are defined by how well they function within their environments. The third conception, which we designate *existentialist*, foregrounds individual student experiences. In existentialism, individuals are not merely thinking subjects but are acting, feeling, and living humans with stories that extend beyond their immediate environments. We describe how instructors with these three conceptions interpret and enact each of the five aspects in a phenomenographic outcome space (Table 1).

Table 1
Outcome Space for Instructor Conceptions of Diversity

	Essentialist	Functionalist	Existentialist
Student Identities: How an instructor interprets student characteristics	Static: Student traits are permanent	Malleable: Student attributes can adapt to the learning environment	Experiential: Students’ lived experiences are inseparable from them as learners
Intelligence mindset: How an instructor perceives student intelligence	Fixed: Intelligence is an innate quality that cannot be changed	Deficit: Expertise in a discipline can be developed over time with resources	Asset: Different experiences can be leveraged as intelligence in learning
Student engagement: How an instructor perceives the impact student diversity has on student engagement	Irrelevant: Student diversity does not contribute to learning	Supporting weaknesses: Students who are more successful can help students who are struggling	Reciprocity: Students can learn from one another’s perspectives and unique experiences
Pedagogical motivation: How an instructor perceives their role in teaching diverse students	Equal treatment: Students are regarded equally to maintain fairness	Accommodation: Student deficits should be attended to	Intentional implementation: Student diversity should be engaged in the course
Legitimized membership: How an instructor positions students relative to the implicit classroom norms and structures	Outsiders: Students who cannot conform to instructor expectations do not belong	Guests: An instructor scaffolds learning environment to help students meet expectations	Rightful presence: An instructor centers student knowledge, experiences, and stories

Student identities

Student identities describes how an instructor interprets the characteristics that make students diverse. In the essentialist conception, an instructor views student characteristics as permanent and unchanging or, in other words, *static*. In the functionalist conception, an instructor perceives student characteristics as *malleable* and acknowledges that student differences position certain students better for success than others. In the existentialist conception, an instructor foregrounds the origins of student identities and recognizes these identities as outputs of the *experiential* lived histories of each student.

Static (essentialist): “Linguistic diversity, well, some of my Chinese students have been great in terms of effort. Some of them, I think, never understood a word I said. And I don’t know why they’re here. So there’s diversity of background in that respect.”

Malleable (functionalist): “I went, ‘Here’s a bunch of readings. Let’s read and talk about them.’ They didn’t know what to do. Some had good high school backgrounds, some not up to that. That’s always been a challenge. I’ve always been sympathetic to students. I’ve tried to make things as accessible as I can.”

Experiential (existentialist): “I’m not going to be able to sit with all 200 students and find out what it is about their background that resonate with what they’re trying to learn. By background, it might mean the stories their family told, the way they were taught to approach an assignment in high school (...) The fact that they come from different backgrounds and have had different educational opportunities until they walked in the door affects how they learn and whether or not they feel confident or a bit imposter-ish on campus.”

Intelligence mindset

Intelligence mindset describes how an instructor perceives student intelligence. In the essentialist conception, an instructor views intelligence as a *fixed*, innate quality of a student that defines their ability to succeed. In the functionalist conception, an instructor views intelligence from a *deficit* perspective as a characteristic that can be developed over time. In the existentialist conception, an instructor values students’ *assets* as forms of intelligence.

Fixed (essentialist): “I was a person who told my students if they did poorly on the test, ‘Maybe you should consider changing your major.’ I’m basically telling that student, ‘You cannot get better than this’ and ‘You will always do bad on the exams no matter what you do.’”

Deficit (functionalist): [Referring to students at a two-year institution] “Sometimes I tell my students, ‘When I look at you, a lot of you are as motivated and as intelligent as my class at [four-year institution]. But all of you lack the background from age 13 to 18 to study harder. It’s the discipline to solve problems.’”

Asset (existentialist): “You don’t want to feel, ‘Everyone seems to be getting it but I’m not. I must be dumb.’ It’s like, ‘No, wait. What’s your major? A music major? What can you tell us about this?’ Including and trying to figure out how everyone can participate, feel like they belong, and are helping.”

Student engagement

Student engagement describes how an instructor perceives the impact diversity has on students’ interaction with the course content and with one another. In the essentialist conception, an instructor considers student diversity as *irrelevant* to student learning and engagement. In the functionalist conception, student engagement is oriented around how the learning environment can be organized to *support the weaknesses* of certain groups of students. In the existentialist conception, student engagement is characterized by the interpretation that every student possesses a unique combination of knowledge, experiences, and skills; thus, the learning environment should facilitate *reciprocity*, or a sharing of these individual characteristics.

Irrelevant (essentialist): “You’re saying that from the student’s point of view, does their own diversity influence the way they learn? I wouldn’t think so. I think we all learn in similar ways.”

Supporting weaknesses (functionalist): “If I give my students group work, that means that there’s a group of four but only two people work because the smart kids do all the problems (...) I say, ‘After you’re done, I’ll pick one random person to do the problem.’ So then, everybody needs to know it. They need to talk to each other.”

Reciprocity (existentialist): “More experiences that students have in and out of the classroom—in terms of working with a diverse student population—is going to help them in the long run. Whether they go to academia or another job, they’re going to work with diverse employees. The more they understand how to work with different personalities, mindsets, the more prepared they’re going to be to help make a change for the world. (...) It will really benefit them in creating a more meaningful existence in their work or personal life.”

Pedagogical motivation

Pedagogical motivation describes how an instructor perceives their role in teaching students from diverse backgrounds. In the essentialist conception, an instructor views a responsibility to attend to the idea of fairness and employ instructional strategies based on *equality*. In the functionalist conception, an instructor recognizes that diversity impacts student circumstances and affects student performance; thus, an instructor should alter instructional strategies to *accommodate* student diversity. In the existentialist conception, an instructor attends to the importance of diversity within the classroom and *intentionally implements* pedagogical strategies and curriculum that fosters thinking and conversations centered around diversity and social justice issues.

Equal treatment (essentialist): “I treat everyone the same. I grade everybody the same. I’m grading based on the quality of their work.”

Accommodations (functionalist): “I try my best to have policies in class that make it clear to students that it’s okay for them to have other things going on in their lives. I do that by dropping a homework and a quiz without any penalty.”

Intentional implementation (existentialist): “I thought, ‘Who cares if this class is about mechanics and materials? This is still about humans.’ Bringing in some of these conversations into my class. I feel like it’s my duty. The first female crash test dummy was just designed. Because we’ve always used the standard male crash test dummy, women are more likely to be injured and die in car accidents. (...) I showed them this picture, ‘Here’s the first female crash test dummy. Why is this important? Why do we need to create different crash test dummies?’”

Legitimized membership

Legitimized membership describes how an instructor positions students relative to implicit classroom norms and structures. In the essentialist conception, an instructor considers students as *outsiders* and attends to the lack of skills and abilities that students have. In the functionalist conception, an instructor positions students as *guests* and holds a sense of responsibility to help students navigate the rigorous expectations of higher education. In the existentialist conception, an instructor attends to the *rightful presence* of students in higher education and values the knowledge and experiences that students bring, even if it does not align with existing norms and practices.

Outsiders (essentialist): “My first semester ever, I would teach, then give a midterm, and say, ‘We did all these problems and lectures. How come they don’t know how to do this?’ The first expectation when you teach is everything you say, students should know how to do.”

Guests (functionalist): “I put in a ton of scaffolds. (...) I’m like, ‘Here’s the homework. It’s really important you do it every week. Here are the applications, activities, and quizzes.’ I do all of that because I think it helps the student diversity—the students that don’t know that they need to study every week, right? They might not know how to really do that.”

Rightful presence (existentialist): “For an instructor, it should be productively humbling to say, ‘I can’t know everything about your experiences.’ I felt it was important to invite the students into the exploration process and make them feel like they could be experts about it. There’s so much about the discourse of academic English and the discourse of higher education that is still couched in a really WASP [White Anglo-Saxon Protestant] way. And if we presume that’s the

only way people will display or perform knowledge, then we're cutting people out automatically who don't want to present or speak that way."

Outcome space

All of the instructors interviewed in our study recognized diversity, yet as our findings have shown, there is a wide range of how diversity is understood and manifested (Table 1). The five aspects (student identities, intelligence mindset, student engagement, pedagogical motivation, and legitimized membership) are organized into rows and represent the compartmental characteristics of diversity that instructors attended to. Represented by the columns, we identified the three conceptions (essentialist, functionalist, and existentialist) based on a holistic integration of the aspects around similar philosophical assumptions (Table 1).

In the essentialist conception, an instructor perceives students as having static characteristics and fixed intelligence. Diversity is irrelevant to student learning and engagement. An instructor adopts pedagogical strategies based on equal treatment and meritocracy and positions students as outsiders to higher education. In the functionalist conception, an instructor holds the understanding that students can be functional in higher education with support and resources. Student characteristics are viewed as malleable and student intelligence is perceived from a deficit perspective. An instructor accommodates students' diversity and learning environments are organized so that accomplished students can support those with weaknesses. Students are guests since their presence still requires affirmation and assistance from the structures and authority in higher education. In the existentialist conception, an instructor views individual experiences as the origin for student characteristics and as assets in building upon knowledge and skills. An instructor facilitates reciprocity or exchange between students and takes responsibility for engaging them in discussions about how their experiences and the experiences of others impact their work as scholars in their disciplines. Students are rightfully present and belong in higher education spaces.

Implications

Table 1 can serve as a tool for instructors to reflect on their own beliefs. Such processing offers ways to consider new dimensions of diversity and how it impacts the classroom from both instructor and student perspectives. While the existing literature describes a handful of PD interventions aimed at transforming instructional practices, our outcome space offers a framework to support conceptual change. Given the relationship between conceptions and practices, we argue that PD that incorporates conceptual change can promote the adoption of more targeted practices to foster inclusive classroom climates. While the findings we have articulated from our study do not directly suggest any modes or mechanisms for conceptual change, existing literature has several suggestions.

The first mechanism for conceptual change is based in Relational Cultural Theory (RCT), a paradigm in which individuals grow through their relationships with others (Schwartz, 2019). RCT asserts that meaning and empowerment can be derived by instructors as they connect authentically with their students. In developing greater awareness and understanding of their students' backgrounds, instructors are positioned to recognize aspects of diversity during interactions and curriculum design. Eastman et al. (2019) conducted a case study of an engineering professor and documented the professor's changing understanding of race, privilege, and equity. They noted that the professor's interactions with minoritized students were essential experiences that promoted a change in perspective. While building relationships with students may be an informal practice undertaken by individual instructors, formal interventions can facilitate these interactions. For example, Carballo et al. (2019) reported on a training intervention in which faculty conceptions of disability and inclusive education were transformed towards a more positive understanding of how they could support their students with disabilities. They noted that an important feature of their intervention was that students with disabilities were invited to speak about their experiences at each session.

The second mechanism for conceptual change utilizes the phenomenographic lens. The emphasis on levels of awareness in phenomenography provides a pedagogical framework known as the Pedagogy of Learning (Marton et al. 2004), which allows for "the object of learning to serve as a starting point to explore the conditions that make learning possible" (Wright & Osman, 2018, p. 264). If the goal is for instructors to have and enact upon a deeper understanding of the diversity that exists in their classroom, they must be familiarized with the range of conceptions in order to reflect on their own level of awareness and current conceptions and approaches to diversity (Trigwell et al., 2005; Wright & Osman, 2018). The aspects and conceptions we have outlined in our outcome space should be explicitly presented to instructors as the object of learning. This presentation of contrasting conceptions may enable instructors to reflect on what conception of diversity they currently hold and what conception of diversity they desire to hold. The aspects provide instructors with different angles of diversity to which they should attend. These in turn can be connected to specific approaches and practices. Whether it is

through individual reflection or a formalized PD opportunity, we invite instructors to recognize the power and impact their beliefs and actions have on students.

References

- Åkerlind, G. S. (2005). Variation and commonality in phenomenographic research methods. *Higher Education Research and Development*, 24(4), 321-334.
- Amundsen, C., & Wilson, M. (2012). Are we asking the right questions? A conceptual review of the educational development literature in higher education. *Review of Educational Research*, 82(1), 90-126.
- Barton, A. C., & Tan, E. (2020). Beyond equity as inclusion: A framework of “rightful presence” for guiding justice-oriented studies in teaching and learning. *Educational Researcher*, 49(6), 433-440.
- Bernard, H. R. (1988). *Research methods in cultural anthropology*. SAGE Publications, Inc.
- Boelens, R., Voet, M., & De Wever, B. (2018). The design of blended learning in response to student diversity in higher education: Instructors’ views and use of differentiated instruction in blended learning. *Computers and Education*, 120, 197-212.
- Booker, K. C., Merriweather, L., & Campbell-Whatley, G. (2016). The effects of diversity training on faculty and students’ classroom experiences. *International Journal for the Scholarship of Teaching and Learning*, 10(1), n1.
- Carballo, R., Morgado, B., & Cortés-Vega, M. D. (2019). Transforming faculty conceptions of disability and inclusive education through a training programme. *International Journal of Inclusive Education*, 1-17.
- Dewsbury, B., & Brame, C. J. (2019). Inclusive teaching. *CBE—Life Sciences Education*, 18(2), fe2.
- Eastman, M. G., Miles, M. L., & Yerrick, R. (2019). Exploring the White and male culture: Investigating individual perspectives of equity and privilege in engineering education. *Journal of Engineering Education*, 108(4), 459-480.
- Freire, P. (1970). The adult literacy process as cultural action for freedom. *Harvard Educational Review*, 40(2), 205-225.
- Glaser, B. G., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.
- González, N., & Moll, L. C. (2002). Cruzando el puente: Building bridges to funds of knowledge. *Educational Policy*, 16(4), 623-641.
- Gordon, S., Reid, A., & Petocz, P. (2010). Educators’ conceptions of student diversity in their classes. *Studies in Higher Education*, 35(8), 961-974.
- Gutiérrez, R. (2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, 44(1), 37-68.
- Harrison, C., & Tanner, K. D. (2018). Language matters: Considering microaggressions in science. *CBE—Life Sciences Education*, 17(1), fe4.
- Ho, A., Watkins, D., & Kelly, M. (2001). The conceptual change approach to improving teaching and learning: An evaluation of a Hong Kong staff development programme. *Higher Education*, 42(2), 143-169.
- Jokikokko, K. (2005). Interculturally trained Finnish teachers’ conceptions of diversity and intercultural competence. *Intercultural Education*, 16(1), 69-83.
- Kezar, A., Eckel, P., Contreras-McGavin, M., & Quaye, S. J. (2008). Creating a web of support: An important leadership strategy for advancing campus diversity. *Higher Education*, 55(1), 69-92.
- Lamb, P., Sandberg, J., & Liesch, P. W. (2011). Small firm internationalisation unveiled through phenomenography. *Journal of International Business Studies*, 42(5), 672-693.
- Macdonald, R. H., Beane, R. J., Baer, E. M., Eddy, P. L., Emerson, N. R., Hodder, J., ... & Ormand, C. J. (2019). Accelerating change: The power of faculty change agents to promote diversity and inclusive teaching practices. *Journal of Geoscience Education*, 67(4), 330-339.
- Marton, F. (1981). Phenomenography—describing conceptions of the world around us. *Instructional Science*, 10(2), 177-200.
- Marton, F., & Booth, S. A. (1997). *Learning and awareness*. Psychology Press.
- Marton, F., Runesson, U., & Tsui, A. (2004). The space of learning. In: F. Marton & A. B. M. Tsui (Eds.), *Classroom discourse and the space of learning* (pp. 3-40). Lawrence Erlbaum.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications, Inc.
- Pratt, D. D. (1992). Conceptions of teaching. *Adult Education Quarterly*, 42(4), 203-220.
- Schoenfeld, A. H. (1992). On paradigms and methods: What do you do when the ones you know don't do what you want them to? Issues in the analysis of data in the form of videotapes. *The Journal of the Learning Sciences*, 2(2), 179-214.
- Schwartz, H. L. (2019). *Connected teaching: Relationship, power, and mattering in higher education*. Stylus Publishing, LLC.

- Suárez-Orozco, C., Casanova, S., Martin, M., Katsiaficas, D., Cuellar, V., Smith, N. A., & Dias, S. I. (2015). Toxic rain in class: Classroom interpersonal microaggressions. *Educational Researcher*, 44(3), 151-160.
- Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: Implications for clinical practice. *American Psychologist*, 62(4), 271.
- Svensson, L. (1997). Theoretical foundations of phenomenography. *Higher Education Research and Development*, 16(2), 159-171.
- Trigwell, K., Prosser, M., & Ginns, P. (2005). Phenomenographic pedagogy and a revised approaches to teaching inventory. *Higher Education Research and Development*, 24(4), 349-360.
- United Nations Educational, Scientific, and Cultural Organization (2020). *Towards inclusion in education: Status, trends, and challenges*.
- Wright, E., & Osman, R. (2018). What is critical for transforming higher education? The transformative potential of pedagogical framework of phenomenography and variation theory of learning for higher education. *Journal of Human Behavior in the Social Environment*, 28(3), 257-270.
- Yosso, T. J. (2005). Whose culture has capital? A critical race theory discussion of community cultural wealth. *Race, Ethnicity and Education*, 8(1), 69-91.

Acknowledgements

We thank the instructors whose insights are highlighted in this paper. This material is based upon work supported by the U.S. National Science Foundation under grant number DUE-1612258, DUE-1645083, and DUE-1821724, and HRD-2113355. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.