Studying as Experimentation

Habits and Obstacles in the Ecology of the University

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Published in:
Philosophy and Theory in Higher Education

DOI:
10.3726/PTIHE032021.0005

Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Feldt, J. E., & Petersen, E. B. (2021). Studying as Experimentation: Habits and Obstacles in the Ecology of the University. *Philosophy and Theory in Higher Education*, *3*(3), 55-67. [13].
https://doi.org/10.3726/PTIHE032021.0005

5 *Studying as Experimentation: Habits and Obstacles in the Ecology of the University*

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Abstract: In this article, and through thinking-with John Dewey, we consider the nature of the experiment and how we, as students and scholars, from experiments learn how to increase our purposeful transactions with the world. We particularly emphasize how knowing, knowledge, and thinking, all prominent concepts in the literature about the purpose of higher education, are outcomes of experimenting with obstacles, problems, or possible paths and movements. With this Deweyan point in mind, we argue against skepticism about educational "outcomes" and false dichotomies between experimentation and "outcomes." In the article, we suggest that outcomes of experiments are events, or happenings, which change things and introduce newness, future, through which paths between before and coming change. Such a conception of outcomes is radically different than what we, and others, in the literature call "outcomes-driven." Paraphrasing Dewey, such outcomes are adventures not insurance. Finally, we encourage a conversation about what experimentation normatively, conceptually and practically means as a purpose for higher education.

Keywords: experimentation, John Dewey, problem-solving, meaning-making, inquiry, pragmatism

Introduction

One of the most significant features of current criticism of university policy and practice is the critique of the omnipresent focus on "outcomes." Measuring the outcomes of learning, evaluating the outcomes of research, emphasizing the employability and life incomes of degrees have introduced a back-tracking structural model, which from already known positive outcomes designs how to stimulate the university to produce these outcomes. This is a fundamental challenge for the university and its historically developed ecology of practices. Some of the most promising paths of thinking against this radical instrumentalization mobilize the concept of experimentation and the concept (and practice) of studying.[1] Here, following Masschelein and Simons' invitation to think about how we might reconstruct and reclaim the university as a pedagogical form, as *universitas studii*, we wish to offer our conceptualization of "studying as experimentation."

It appears to us that the concept of experimentation most often is invoked as a countering concept to the concept of outcomes, or outcomes-driven (cf. Masschelein et al.). Experimentation implies that the outcomes are unknown, which makes the outcomes-driven university nonexperimental, or at least it implies that experimental teaching and research survives despite, and sometimes in spite. Using the concept of experimentation as a counter-concept to outcomes-driven also entails an extensive criticism of how research and teaching are increasingly being separated from each other while they at the same time both lose their inquiring, experimental drives; both "fields" are becoming "results" driven.[2] Experimentation is certainly a fitting counter-concept to and a defense against the narrow focus on predetermined outcomes. But what does experimentation mean, what could it mean, if we were to think about experimentation as *the* normative practice within *universitas studii*?

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1 Jan Masschelein, "Experimentum Scolae. The World Once More But Not (Yet) Finished," *Studies in Philosophy and Education* 30, no. 5 (2011): 529–535; Jan Masschelein, "Some Notes on the University as Studium," in *Reconceptualizing Study in Educational Discourse and Practice*, ed. Claudia Roitenber (London: Routledge, 2018), 40–53; Hans Schildermans, Maarten Simons, and Jan Masschelein, "The Adventure of Study. Thinking with Artifices in a Palestinian Experimental University," *Ethics and Education* 14, no. 2 (2019): 184–197.

2 Jan Masschelein and Maarten Simons, "The University as Pedagogical Form: Public Study, Responsibility, Mondialisation," in *Past, Present, and Future Possibilities for Philosophy and History of Education*, eds. Stefan Ramaekers and Naomi Hodgson (Cham: Springer, 2018), 47–61.

We suggest that a stimulating place to begin thinking more normatively about what experimentation could mean for us going forward would be John Dewey's work. For several reasons. For one, Dewey had firm ideas about what experimentation is in a nonoppositional, categorical way. Second, that his perspective, as well as other early pragmatist perspectives, did not consider "outcomes-driven" the opposite of "experimental." It could be said that Dewey's thought as well as pragmatism in general, is an *aposteriorist* philosophy; meaning that the experiment is known by its outcomes and that there will always be an end-in-view. In other words, it is impossible to reject "outcomes" and rely on "the experiment" to save us, students and scholars, from what we produce in the eyes of others and what Dewey himself called "ulterior aims for which the professed aim is but a mask."[3] Third, for good reasons, many authors on the purpose of the university invoke the concept of "thinking" as a highly complex, speculative category and as a desirable educational aim.[4] Central to Dewey was also the notion of "thinking" but in a quite different way. Thinking is not simply the starting point, but in itself, an outcome of experiments.

What follows has the character of explorative, essayistic, thinking-with Dewey into the question of how experimentation can be seen as the nature of studying, as both highly regulated and imaginative, inventive, rehearsals of unknowns, at the same time. So, with this revisiting of Dewey, we join the ongoing inquiry into how the university as a place, as an institution and ecology of study, can be reconstructed as an experimental and explorative adventure.[5]

The Experimental Heuristics: What If?

> *Ignoring the fact that truth can be bought only by the adventure of the experiment, dogmatism turns truth into an insurance company.*[6]

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3 John Dewey, *Democracy and Education* (Macmillan: New York, 1916), 260.

4 Søren S. Bengtsen and Ron Barnett, *The Thinking University. A Philosophical Examination of Thought and Higher Education* (Cham: Springer, 2018).

5 Bruno Latour, *Is Geo-logy the New Umbrella for all the Sciences? Hints for a Neo-Humboldtian University*. Speech at Cornell University 25th October. Accessed March 29, 2021: https://czo-archive.criticalzone.org/images/national/associated-files/Calhoun/Latour-CORNELL-2016.pdf; Martin Savransky, *The Adventure of Relevance. An Ethics of Social Inquiry* (London: Palgrave, 2016).

6 John Dewey, *Human Nature and Conduct. The Collected Works of John Dewey* (Carbondale: Southern Illinois University Press,1922/2008), 163.

Looked upon from the perspective of its effects, studying is a deliberate experiment with meaning-making and problem-solving. John Dewey asserted that we only think when we encounter problems. These problems can take many forms. We may wish to understand something that we do not understand, or we may wish to understand something differently. We may wish to address or solve some issue that we cannot make sense of and that we are unsure about how to act upon, or we may need to apply technical solutions to practical problems to see if this works here, with this specific problem. The nature of the process is one of experimentation: What if? What if this meant that? What if this was related to that? What happens if we combine this stuff with that stuff? Studying is an experiment because we learn from experimental outcomes. In contrast to play, which may also be considered a problem-solving and meaning-making activity, studying is deliberate because we are conscious, purposeful, and evaluative in studying. We are interested in reflecting on the effects of experimentation even or especially when the experimentation did not turn out to help us with our problem.

When we approach studying as experimentation, we need to consider the interplay between creativity and discipline, between inspired inventiveness and what Facer[7] calls stewardship, what we elsewhere have called experienced interlocution.[8] The term experiment brings up various connotations. One reading will emphasize the creative, abductive nature of the experiment, the imaginative and curious attitude, where we take risks to see what happens. Here we play with materials and substances in new ways, genuinely exploring the effects. It may blow up in our faces or lead to new discoveries. Another reading will emphasize the experiment as one bound to protocol to ensure the possibility of replication and external verification.[9] Here we are bound to develop substantiated hypotheses, which require intimate knowledge of previous discoveries and experimental set-ups. How has the problem been approached, understood, solved, or tested before? The experiment requires discipline, understood as conduct, knowledge, and stewardship. Studying as experimentation, we argue, requires *both* forms of attitudes and practices.

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7 Keri Facer, "Governing Education Through the Future," in *Making Education: Material School Design and Educational Governance*, eds. Ian Grosvenor and Lisa Rosén Rasmussen (Cham: Springer, 2018), 197–210; Keri Facer, "The University as Engine for Anticipation: Stewardship, Modelling, Experimentation, and Critique in Public," in *Handbook of Anticipation* (Cham: Springer, 2019), 1439–1457.

8 Jakob Feldt and Eva Bendix Petersen, "Inquiry-based Learning in the Humanities: Moving from Topics to Problems Using the 'Humanities Imagination,'" *Arts and Humanities in Higher Education* 20, no. 2 (2021).

9 see also Stengers in Savransky, "The Adventure,"

They are not each other's opposites. Instead, they rely on, enable, and stimulate each other. Experimentation is at the core of knowledge creation and a scientific attitude to the world, and our study practices should reflect that.

Experiments and Habits

> *The native and unspoiled attitude of childhood, marked by ardent curiosity, fertile imagination, and love of experimental inquiry, is near, very near, to the attitude of the scientific mind.*[10]

Following Dewey's line of thinking, studying as experimentation entails the continuation of old habits and the development of new ones. As we have already suggested, one of the major differences between Dewey's investigating and experimenting child and studying is that studying is an activity methodologically regulated by strong habits created over long periods of time in schools and universities. Such strong habits include, for example, how to read, measure, or argue. The child gradually learns how to understand the results of her actions and she gradually learns how to increase her purposeful transactions with the environment, and even to include the experiences of others. In a general perspective, habits are ways of knowing the world. Not as separated from the world, but as "doings" that do the perceiving, the reasoning, the judging. This counts for seamless habits, both instinctual and cultural, which we do not have to think about. Such habits make things work for us. Such habits reduce complexity and brush away potential obstacles in front of the desired ends. With Dewey's phrase, "we may, indeed, be said to *know how* by means of our habits."[11] Without existing habits, we would not know how to study. We would not know how study practices in a given field have organized transactions with the world and accordingly our studying would disintegrate into aimless confusion. In this way, when studying, strong habits direct desires for knowing. But performing the habits themselves is not knowing and performing the practices of study is not, in itself, studying. So, even though we know how to study from our habits, and even though our habits are the perceiving, the knowing, the reasoning, the blind reproduction of habits in studying is not the purpose of studying itself. Quite the opposite.

Habits of studying are both regulative and productive. Studying is often tedious, repetitive, stifling on the body, and hard on the eyes. But at the same time, it transacts not only immediate investigative desires, but generational,

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[10] John Dewey, *How We Think* (Boston: D.C. Heath & co. Publishers, 2010), preface.
[11] Dewey, "Human Nature," 124.

historical, ways of acting, organizing, and perceiving knowledge, which are embedded in, and not external to, "the what," which is being studied.[12] Schools and universities, churches, monasteries, synagogues, mosques, and other places of study have been formed by study practices and have, in turn, formed the answers to what studying is. The particular study practices of orthodox Jews in shuls who in trance-like movement read from the Torah to Howard Gardner-inspired progressive schools in Denmark where the children learn that they have their own personal styles of studying, reflect how studying, in Nelson Goodman's words,[13] can be conceived of as ways of world-making. Despite the complete dependence of our understanding on how studying has been practiced, practices change and new attitudes to studying show themselves more conducive for transforming our investigative desires into actions that work for us, in short, into problem-solving.

Strong habits are the foundation of forming our investigative desires into actions and capacities, which actually work. Strong habits of studying are often borne out of field specific scientific practices. But it does not change the fact that strong habits of studying are the same as more effectful, more purposeful studying. If habits of studying were reproduced blindly, if study activities were routes without detours from A to B, if understanding an equation or a text was not an obstacle toward resuming movement, if passing the obstacle was not experimental, asking "What if I do this or that?" then the purpose of studying would not be fulfilled. No growth in relation to possible transactions with the world would have been gained, and such habits could be characterized as mechanistic reproduction or dogmatism (cf. Dewey above). Habits do not in themselves describe, encounter, or transact with the world. Rather, the *obstacles* that we encounter while doing what we think we know how to do open our perception of and transactions with the environment. It is the disturbances on the path which make us students, make us stop and reflect, make us think, make us look again and more carefully; forcing us to do something else than our habits of thought had projected. The disturbances and obstacles are, in fact, the only reason that we can see our habits and make judgments about their adequacy based on experiences, memories, and observations.

We can think about the work of habits in studying in several ways. There are habits of thought, as mentioned above, which should be challenged by encounters with disturbances and obstacles between the intellectual path from A to B. The path from A to B gets new coordinates in the process. There

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[12] John Dewey and Arthur Bentley, *Knowing and the Known* (Boston: The Beacon Press, 1949).

[13] Nelson Goodman, *Ways of Worldmaking* (Indianapolis: Hackett Publishin, 1978).

are methodological habits—ways of doing within scientific fields—which can include a more mechanistic aspect. The data-producing machine works in this way, and not in that. Without such methodological habits to regulate studying, it is difficult, if not impossible, to learn what such methodologies brush aside to ease the path and which objects they produce; how they have shaped the boundaries of their field and formed its landscape. Then there are also bodily and spatial habits. Some studying is collective, based on laboratory work, some studying is solitary reading, other study practices are production-based, all of which have evolved over time with references to historical ways of transacting with the world. From religion to the stage (medical and lecture theaters), from artistic expression and practical making, from alchemy to materialist co-construction between "humans" and "nature," organizing studying reflects form-giving to and with the world.

Experimentation occurs when habits cannot ensure smooth sailing or fail in helping us address a problem. Experimentation follows from the most banal everyday problems, such as facing a door that will not open—leading to a whole chain of investigational action (possibly ending with a hard kick to the door)—to problems encountered in making sense of data or in textual interpretation. All learning from experience starts with an experiment with problem-solving and meaning-making, which is then included in the movement forward.[14] When we study an advanced theory we try cracking it by applying previous experimental techniques, such as using analogies, examples, reversals, imaginative suggestions to what this would mean in practice. All of these techniques might go on only in intellectual activity while sitting at a desk, but it is nevertheless an experiment with problem-solving and meaning-making. "Is this the same as that?" "Can I understand x in this way?" Suddenly, our experimental thinking, our inner deliberations, catch some connections between knowing and the known, to paraphrase Dewey and Bentley's 1949 book. The experiment establishes the connection between knowing and that which is known. We might even say that it is the activity of trying out paths of action that constitutes both knowing and the known.

The Ecology of Studying

> *Each institution has brought with its development, demands, expectations, rules, standards. These are not mere embellishments of the forces which produced them, idle decorations of the scene. They are additional forces. They reconstruct. They open new avenues of endeavor and impose new labors.*[15]

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[14] John Dewey, *Logic: The Theory of Inquiry* (New York: Henry Holt, 1938), 7–8.

[15] Dewey, "Human Nature," 57.

In the ecology of studying, the environment, the university, and the student are mutually constitutive.[16] In turn, study as experimentation is dependent upon and constitutive of its ecology. This means that the student, while doing study practices brought with the habits of the university, undergoes transformations. These "undergoings," these transformations, are doings, actions, themselves that reconstruct the university. Studying is part of a wider institutional ecology that includes many things: from symbolic distinctions between first-year students and professors to ways of communicating, to things and spaces such as laboratories, computers, libraries, and lecture halls. All of which are forces that take part in directing and redirecting investigative desires. In a Deweyian sense they are sources of energy. These historically developed habits of transaction are all part of a wider ecology of deliberate, educational knowing and knowing-how.

Calling something an ecology refers to the existence of a habitat and a balance. The existence of the habitat depends upon the upholding of the balance, which mutually constitutes the life of the elements of the habitat. Such a conception could, in principle, include the entire world. But, it is important to be more specific about what the ecology of studying is. Included in the ecology of studying is *what* we relate to and what operates when we study. In this way, the ecology is defined by the mutual agency of cultural, social, and methodological habits, transmitted over generations. Transmitted also is the agency of things, such as the materials studied, but also of the rules and regulations enforced by the institution, as well as the desires of the student doing the studying. In a sense, the elements of the habitat are defined by the work they do for constructively transacting the purposefulness of studying. They cannot be considered independently existing entities; they are defined in relation to the other elements. The elements of the ecology ideally cooperate with the purpose of successful transactions, successful problem-solving, and meaning-making, which is always a temporary situation but it nevertheless is an expression of growth in experience, knowledge, and habits.

Practices of studying have incorporated in them the fertility and energies the ecology provides. This means that the cultural and social habits, methodologies, and technologies are incorporated into the outcomes of studying, which then cannot be separated from the ecology that they are a part of. All arts and crafts see and create through the materials and ways of molding and shaping them. Sculptors see and shape with clay, painters with colors, and

[16] Isabelle Stengers, "Introductory Notes to an Ecology of Practices," *Cultural Studies Review* 11, no. 1 (2005): 183–196; Ron Barnett, "The Coming of the Ecological University," *Oxford Review of Education* 37, no. 4 (2011): 439–455.

students and scholars see and shape with whatever materials are the media within their fields. Media here is not a mere communication channel, but the dynamism and possibility of movement created by an ecology. The stuff out of which things grow. In studying, attention must be given to the materials: the texts, the numbers, the computers, the laboratory settings, etc., with the same kind of attention (and even love) as an expert woodworker puts into knowing the wood; how to shape it and how to see what it can become. The process is one of drawing on the experiences of earlier experiments and experimenting once more. In the outcome, the stuff of growth of the ecology is incorporated.

The culturally, socially, and historically transmitted habits of studying are sources of additional force. They carry within them the experiences of generations of previous experiments and habits. They have shaped the ways of transacting with knowledge with the world. Most of the work of such habits and the work of the elements of the ecology are invisible. It is embedded in patterns of behavior and meaning-making, in architectures and technologies, and sometimes the work does not work. Problems, then, become visible, felt. Old habits fail and new practices must be sought. Sometimes, the investigative desires are quelled, controlled to death by protocols, manuals, and standardization, and the road to inquiry is blocked by the very habits that should give the inquiries studying-force. The ecology tips out of balance and the students stop studying. They stop experimenting, but look for secure answers; look for reassurance and insurance, for the truth of the insurance company. Communities of purpose lose their direction and there is confusion about *why* we should do this or that more than about *how*. Habits are then performed for the sake of performing them for other motives than experimenting, investigating, growing, and knowing. Experiments and failures are, in such a situation, undesirable risks—menaces, delays, ventures—which only the bravest students undertake often in opposition to the patterns of behavior of the institutional settings. Insisting on studying as experimentation becomes a protest against a faltering and withering university polluted by ulterior motives and a necessary reminder of the mutually constitutive agency of the elements of the ecology.

Today, many things block the road of inquiry and experimentation for the studying student and scholar. Many activities, incentives, motivations, timeframes, and predefined outcomes in the wider ecology of studying do not support an experimental, genuinely inquiring, practice. With Dewey, we would say that there are currently many interests within the ecology that negate the true educational and public interest. Interests that have a focus on control, predictability, and correct mimicking, rather than genuine problem-solving

and meaning-making that is at the core of the experimental, scientific attitude that we expound on here. In other words, the university as ecology is currently in an unproductive disequilibrium. It is our sense that a focus on the experimental attitude may help the habitat renew its ecology.

The experimental attitude's emphasis on outcomes is of a different nature than what we, and others, critically call "outcomes-driven." In the ecology of studying, the experiment and its outcomes are transformative events. They change things and reconstruct the path between the before and the coming. In this there is, in principle, no difference between the natural science lab and the philological seminar; although there might be a difference in the way we currently weigh the facts they make. In Isabelle Stengers words, in the experimental situation, things are *coming to matter.*[17] In other words, both matter and meaning are made in structured yet experimental transactions where the outcomes are what matters. In the heuristics of the what-if, "happens" is the keyword, challenged by temporary problems with temporary answers; driven by desires to reconstruct, renew, and remain in this state of experimentation. Outcomes are what comes to matter. They are what enters as newness, or, put differently, as future.

Studying Is an Act—Concluding Thoughts

In his well-known early article on the concept of the reflex arc in psychology,[18] John Dewey argued that we had to do away with mechanistic cause-effect and stimuli-response thinking, but not with the fundamental naturalistic principle that human beings act on experiences, in, from, and with their environment. The mechanistic view of human beings in their environment and human beings as "minds" confronted with stimuli to which appropriate "responses" would belong was criticized by Dewey for overlooking the relational and teleological character of responses and stimuli, of effects and causes. Only at the end of a process can we interpret what became the causes and the effects. Even with deliberate processes such as studying, where the "stimuli" can be either narrowly self-chosen, given by the teacher as texts, numbers, as work, or feel like a call from the world, the relational and teleological character of what is stimuli and responses is retained. This Deweyan way of arguing has recently been renewed by Martin Savranski and Isabelle Stengers as an "experimental mode" of thought where creating "possibles"

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17 Savransky, "The Adventure," x.

18 John Dewey, "The Reflex Arc Concept in Psychology," *The Psychological Review*, III (1896).

makes visible and questions existing facts and, in the process, the "possibles" come into view themselves.[19]

This means that we, in Dewey's words, can consider that "the discovery of the stimulus is the response to possible movement as stimulus."[20] In other words, that reading, calculating, working with materials, are the activities of studying that discover the stimuli as responses to transformations of temporalities between, before, and after transformations of judgments between doubt and increased (temporary) wholeness. We learn from this that even deliberate, designed, study practices must remain open for discoveries, which are experimental in nature and whose temporary status is that of an end after which the before and the after looks different. Such study practices start with an interest, an inquiry, and a work, which return *a posteriori* to distinctions between causes, effects, beginnings, and ends, because new connections across obstacles have been made. Purposes and teleologies have been reconstructed through acting. If sound is the act of hearing and light is the act of seeing, then studying is the act of experimenting with possible paths of action. Dewey defined "deliberation" this way: as an imaginative rehearsal of possible paths toward the future.[21]

To think of studying as an experimental activity, or as the activity of learning from experimentation (to think of studying as a purposeful activity in general) involves taking a normative stand on what the purpose of studying is. Studying is in this way ultimately recognized as a purposeful activity from the perspective of its effects. Only from the perspective of its effects is it possible to make normative evaluations and normative statements about studying. We must ask "What does the activity lead to?" before we can judge whether it is studying in a purposeful sense; or even studying at all. This is a very difficult question to answer in a specific way. Some effects of studying are immediate, others manifest themselves years later in different contexts. Some effects might lead away from purposes and outcomes wished for by learning plans, teachers, and future employers. So, looked upon from the perspective of its effects, studying is purposeful in the sense of leading to some desired outcome, but at the same time, studying resists this purposefulness in the sense that we do not really know when and where the effects of studying will manifest themselves. And when they do manifest themselves it could possibly be with surprising results.

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19 Isabelle Stengers, *Cosmopolitics I* (Minneapolis: University of Minnesota Press, 2010), 12; Savransky, "The Adventure," 198.

20 Dewey, "The Reflex Arc," 368.

21 Dewey, "Human Nature," 132–133.

Criticizing the outcomes-driven university from the perspective of experimentation should not lead to skepticism about being judged by outcomes. Experimentation is also outcomes-driven, only we do not, in principle, know the outcomes in advance. But it is through the outcomes that we know the experiment; that we learn ways of transacting with the environment. It is through and after the experiment that we think. Studying-as-experimentation is not for the sake of experimentation in itself, but for a more open and radical engagement with the world. That is why we must discuss what we mean by experimentation and how we as a community of students and scholars can practice it.

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