

# Pattern Language and the Future of Education in Light of Constructivist Learning Theories, Part 3

## John Dewey's Concept of Pragmatism

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### ABSTRACT

This paper examines how pattern languages contribute to cognition and knowledge formation and the learning of experiential knowledge with constructivist learning theories. Constructivism states that people do not simply take in knowledge from the external world, but construct the knowledge from their experiences. This research uses a constructivist lens to explain pattern language, its functions, how it can be learned, and how it can support various practices. This paper is the third in a series of papers that consider pattern languages through a constructivist perspective, with a particular focus on the John Dewey's theories related to pattern language.

### CCS CONCEPTS

[Social and professional]: Professional topics—*Informal education; K-12 education; Adult education*

### KEYWORDS

learning, experience, Constructivism, Pragmatism, pattern language, design patterns

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## 1 Introduction

Pattern Language is knowledge of the doing/being in a certain field and the actual experiences related to this knowledge that are put into words to support others and help them practice by themselves. This paper introduces several of John Dewey's theories and discusses pattern language's role and functions in learning from the perspective of John Dewey's pragmatism. This

is the third in a series of papers that discuss the functions of pattern languages using constructivist theories of cognition and learning (Iba and Munakata, 2019; Iba and Burgoyne, 2019; Iba and Iwata, 2019).

John Dewey (1859–1952) was an American philosopher and pedagogue. While most of Dewey's ideas were based on pragmatism, his thoughts were also related to constructivism. His ideas also overlapped with those of Piaget, which are introduced in the fourth paper of this series, as they both believed that living beings interacted with their environments and constructed knowledge from these interactions. Dewey's ideas also overlapped with those of Vygotsky, which were introduced in the second paper of this series, as they both emphasized the importance of the interactions with others, with Dewey in particular focusing on experiences as tools of inquiry in society.

The following provides an overview of Dewey's various theories, reveals how pattern languages can be understood based on these theories, and also discusses the links with the creative society (Iba, 2013) and how this can be realized with the support of pattern languages.

## 2 Dewey's Theories

### 2.1 The Principle of Continuity and the Reconstruction of Experience

Dewey perceived living creatures as beings that unlike inanimate objects, produced their own energy and used it for their own preservation, growth, and renewal, stating that "life is a self-renewing process through action upon the environment" (Dewey, 1916, p.4). Dewey believed humans were able to not only renew themselves organically, but also continuously renew their experiences within the society.

Dewey defined *experiences* as interactions with the environment and believed that experiences included both the actions and the consequences, which he labelled the "principle of interaction" which simply meant that experiences are born from an involvement with the things and others in our environment.

Dewey was emphatic that "all human experience is ultimately social" (Dewey, 1938a, p.38) and stated that "we live from birth to death in a world of persons and things which in large measure

is what it is because of what has been done and transmitted from previous human activities” (Dewey, 1938a, p.39). Therefore, he believed that experiences did not arise within a vacuum but be affected from the outside, as he explained.

“No one would question that a child in a slum tenement has a different experience from that of a child in a cultured home; that the country lad has a different kind of experience from the city boy, or a boy on the seashore one different from the lad who is brought up on inland prairies.” (Dewey, 1938a, p.40)

This perspective overlapped with Vygotsky’s cultural-historical theory of development (Iba and Burgoyne, 2019); that is, any experience is composed of elements in the environment, the inner thoughts and feelings about these elements, and the relationships with others. The *context*, however, can also include the surrounding nature, buildings, and facilities, the people being talked to and the subject being talked about, the toys being played with, the books being read, the equipment, and materials being used, etc. Therefore, these parts of the *context* then interact with the requirements, aspirations, goals, and abilities to create the experiences.

Although Dewey believed that “because every experience is constituted by interaction between “subject” and “object,” between a self and its world, it is not itself either merely physical nor merely mental, no matter how much one factor or the other predominates,” (Dewey, 1934, p.256) as the “subject” and the “object” are not merely interacting but are part of each other. Therefore, rather than understanding the “subject” and “object,” the action being taken and the outer influences that are caused or affected by these actions as two separate, interacting things, Dewey understood the “subject” and “object” as one thing; that is, there was “no division between act and material, subject, and object, but [the situation] contains them both in an unanalyzed totality.” (Dewey, 1925a, p.8). Dewey stated that rather than saying “I experience” (Dewey, 1925a, p.232), it was more accurate to say that “It experiences or is experienced” (Dewey, 1925a, p.232).

Dewey claimed that the function of intelligence was to grasp the patterns and structures from this combined state and clarify the relationships between the actions and the consequences.

“An experience has pattern and structure, because it is not just doing and undergoing in alternation, but consists of them in relationship. To put one’s hand in the fire that consumes it is not necessarily to have an experience. The action and its consequence must be joined in perception. This relationship is what gives meaning; to grasp it is the objective of all intelligence.” (Dewey, 1934, p.46)

Dewey also believed that education was a “reconstruction or reorganization of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience” (Dewey, 1916, p.84).

“I believe, finally, that education must be conceived in a continuing reconstruction of experience.” (Dewey, 1897, p.12)

The “reconstruction or reorganization of experience,” involves two elements: “the increment of meaning” (Dewey, 1916, p.84) and “an added power of subsequent direction or control” (Dewey, 1916, p.84). Education allows people to perceive and notice the way that their activities are related to other activities, and the interactions between these activities, which according to Dewey, was the “the increment of meaning” of experience.

If you become aware of *what you are doing* and *what you are trying to do* and work on the results, it is possible to know what to expect, to avoid undesirable results, and be prepared to achieve better results. In Dewey’s words, this meant that there was “an added power of subsequent direction or control” (Dewey, 1916, p.84). Dewey thought that these two senses for the reconstitution of experience were the essence of education.

Dewey also felt that there were two aspects to the *quality of an experience*: “an immediate aspect of agreeableness or disagreeableness” (Dewey, 1938a, p.27) and “its influence upon later experiences” (Dewey, 1938a, p.27). For most people, the quality of an experience is related to the former; therefore, to understand the meaning for the quality of the latter, it is necessary to understand Dewey’s principle for the continuity of experience.

Dewey believed that an experience was not an isolated event but had continuity because of the influence that past experiences had on the quality of a present experience and the influence the present experience will have on the quality of future experiences.

“Wholly independent of desire or intent, every experience lives on in further experiences.” (Dewey, 1938a, p.27)

“there is some kind of continuity in any case since every experience affects for better or worse the attitudes which help decide the quality of further experiences, by setting up certain preferences and aversions, and making it easier or harder to act for this or that end. Moreover, every experience influences in some degree the objective conditions under which further experiences are had.” (Dewey, 1938a, p.37)

Therefore, education based on experience means “to select the kind of present experiences that live fruitfully and creatively in subsequent experiences” (Dewey, 1938a, p.28). Therefore, based on the “continuity of experience” principle, an educator’s role should be to discover and differentiate the experiences the students will have and the experiences the students should have and determine where the students’ present experiences lie in relation to these.

“It is his business to arrange for the kind of experiences which, while they do not repel the student, but rather engage his activities are, nevertheless, more than immediately enjoyable since they promote having desirable future experiences.” (Dewey, 1938a, p.27)

"It is then the business of the educator to see in what direction an experience is heading. ... Failure to take the moving force of an experience into account so as to judge and direct it on the ground of what it is moving into means disloyalty to the principle of experience itself." (Dewey, 1938a, p.38)

Dewey stated that "It is to emphasize the fact, first, that young people in traditional schools do have experiences; and, secondly, that the trouble is not the absence of experiences, but their defective and wrong character --- wrong and defective from the standpoint of connection with further experience" (Dewey, 1938a, p.27), which connects with the following quote:

"The educator more than the member of any other profession is concerned to have a long look ahead." (Dewey, 1938a, p.75)

Here, Dewey is emphasizing the experiences that lead to future experiences rather than accumulating knowledge for the future; however, Dewey was critical of sacrificing current experiences for the future as he believed that present experiences were extremely significant because of their connections to future experiences. In relation to traditional education that "by acquiring certain skills and by learning certain subjects which would be needed later (perhaps in college or perhaps in adult life) pupils are as a matter of course made ready for the needs and circumstances of the future." (Dewey, 1938a, p.47), Dewey commented:

"But it is a mistake to suppose that the mere acquisition of a certain amount of arithmetic, geography, history, etc., which is taught and studied because it may be useful at some time in the future, has this effect, and it is a mistake to suppose that the acquisition of skills in reading and figuring will automatically constitute preparation for their right and effective use under conditions very unlike those in which they were acquired." (Dewey, 1938a, p.47)

"I believe that much of present education fails because it neglects this fundamental principle of the school as a form of community life. It conceives the school as a place where certain information is to be given, where certain lessons are to be learned, or where certain habits are to be formed. The value of these is conceived as lying largely in the remote future; the child must do these things for the sake of something else he is to do; they are mere preparations. As a result they do not become a part of the life experience of the child and so are not truly educative." (Dewey, 1897, p.6-7)

Dewey strongly believed that schools were places where spending time was not just "mere preparation" but rather "worth living for their own sake" (Dewey, 1897, p. 5). "Education, therefore, is a process of living and not a preparation for the future living" (Dewey, 1897, p. 5), and school had to be seen as "life as real and vital to the child as that which he carries on in the home, in the neighborhood, or on the playground." (Dewey, 1897, p. 5). Dewey claimed that as "we always live at the time we live and not

at some other time, and only by extracting at each present time the full meaning of each present experience are we prepared for doing the same thing in the future," (Dewey, 1938a, p.49) that this was not "mere preparation" for the future at the expense of the present. To live creatively in the future, it is necessary to live creatively in the present, which is the implication in Dewey's principle for the "continuity of experience" in education.

The "continuity of experience," therefore, is not related to repeating the same experience as "For we live not in a settled and finished world, but in one which is going on, and where our main task is prospective, and where retrospect --- and all knowledge as distinct from thought is retrospect --- is of value in the solidity, security, and fertility it affords our dealings with the future" (Dewey, 1916, p.163). Continuous learning is significant because the world continues to change and the future is uncertain; therefore, the most important thing is the formation of an attitude towards continuous learning.

"The most important attitude that can be formed is that of desire to go on learning. If impetus in this direction is weakened instead of being intensified, something much more than mere lack of preparation takes place. The pupil is actually robbed of native capacities which otherwise would enable him to cope with the circumstances that he meets in the course of his life." (Dewey, 1938a, p.48)

"What avail is it to win prescribed amounts of information about geography and history, to win the ability to read and write, if in the process the individual loses his own soul: loses his appreciation of things worth while, of the values to which these things are relative; if he loses the desire to apply what he has learned and, above all, loses the ability to extract meaning from his future experiences as they occur?" (Dewey, 1938a, p.49)

Therefore, the central questions we should be asking is whether our current education engenders an attitude or desire to go on learning and whether it is providing the experiences in the present that lead to future experiences. Dewey believed that "every experience is a moving force. Its value can be judged only on the grounds of what it moves toward and into," (Dewey, 1938a, p.38); therefore, the principle behind Dewey's continuity of experiences is pragmatism.

Dewey's pragmatic philosophical stance was characterized by his idea that the value of something was not determined by its presence but by the effect it brought; therefore, the value of experiences is determined by the effect brought by the experiences. Pragmatism, a philosophical position first mooted by Charles Sanders Peirce, became widely known because of William James. Dewey also declared his philosophical position to be pragmatism, and stated the following:

*"It does not insist upon antecedent phenomena but upon consequent phenomena; not upon the precedents but upon the possibilities of action, and this change in point*

*of view is almost revolutionary in its consequences.”*  
(Dewey, 1925b, p.462)

Current experiences affect future experiences and present experiences make subsequent actions either easier or more difficult and change the condition of future experiences. These two aspects were related to Dewey's "quality of experience" ----- "an immediate aspect of agreeableness or disagreeableness" (Dewey, 1938a, p.27) and "its influence upon later experiences." (Dewey, 1938a, p. 27).

## 2.2 School as a Community

Two main principles were behind Dewey's view of the "school as a community": the principle of the interaction of experience and the principle of the continuity of experience. Dewey believed that schools were small communities in which children could experience society as a community, as follows:

“In the first place, the school must itself be a community life in all which that implies.” (Dewey, 1916, p.377)

Dewey's believed that schools should be a "community" rather than just as a "collection" of students. However, people only become part of a community when they have a collaborative purpose and coordinate their actions.

Dewey stated that “the present school cannot organize itself as a natural social unit because just this element of common and productive activity is absent.” (Dewey, 1900, p.14) He claimed that schools were not organized as units and that the "old individualism" deeply ingrained in society was a significant problem, and “there is no defect in traditional education greater than its failure to secure the active co-operation of the pupil in construction of the purposes involved in his studying,” (Dewey, 1938a, p.67) and considered this to be the “biggest flaw.” He saw the neatly arranged desks and chairs in the classrooms as being “for dealing with children *en masse*, as an aggregate of units; involving, again, that they be treated passively.” (Dewey, 1900, p.32) He believed, however, that the situation would be different if schools centered more on active work.

“Helping others, instead of being a form of charity which impoverishes the recipient, is simply an aid in setting free the powers and furthering the impulse of the one helped. ...So far emulation enters in, it is in the comparison of individuals, not with regard to the quantity of information personally absorbed, but with reference to the quality of work done --- the genuine community standard of value.” (Dewey, 1900, p.16)

Just as Vygotsky criticized traditional evaluation methods that only tested what the child could do alone, and emphasized assistance and collaboration in the most immediate development areas, Dewey also believed that the fundamentally individualist nature of schools was a problem, and focused more on the importance of the school in helping students to work together; that is, he believed that the experience of the school as a "community" was necessary for a democratic society.

“To do this means to make each one of our schools an embryonic community life, active with types of occupations that reflect the life of the larger society, and permeated throughout with the spirit of art, history, and science.” (Dewey, 1900, p.29)

In this way, Dewey saw life at school as being a part of a “community.”

“In final account, then, not only does social life demand teaching and learning for its own permanence, but the very process of living together educates. It enlarges and enlightens experience; it stimulates and enriches imagination; it creates responsibility for accuracy and vividness of statement and thought.” (Dewey, 1916, p.9)

In this school as community “the teacher is not in the school to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child and to assist him in properly responding to these influences.” (Dewey, 1897, p.7) Dewey did not limit learning to something that happened at school, but also talked about the ideal learning at home.

“There are certain points of interest and value to him in the conversation carried on: statements are made, inquiries arise, topics are discussed, and the child continually learns. He states his experiences, his misconceptions are corrected.” (Dewey, 1900, p.35)

He then extended these ideas to participation in work.

“Again the child participates in the household occupations, and thereby gets habits of industry, order, and regard for the rights and ideas of others, and the fundamental habit of subordinating his activities to the general interest of the household. Participation in these household tasks becomes an opportunity for gaining knowledge.” (Dewey, 1900, p.35)

The following quote has become more important for the creative society that is emerging in certain parts of the world.

“The ideal home would naturally have a workshop where the child could work out his constructive instincts. It would have a miniature laboratory in which his inquiries could be directed. The life of the child would extend out of doors to the garden, surrounding fields, and forests. He would have his excursions, his walks and talks, in which the larger world out of doors would open to him.” (Dewey, 1900, p.35)

What Dewey expressed here may not always be possible in current Japanese living environments; however, these ideas highlight the importance of developing these types of spaces and opportunities in the home. Dewey believed the experiences to be gained in close communities such as the home and schools were the basis of a democratic society. At the beginning of the essay "My Pedagogic Creed," Dewey said:

“I believe that all education proceeds by the participation of the individual in the social consciousness of the race. This process begins

unconsciously almost at birth, and is continually shaping the individual's powers, saturating his consciousness, forming his habits, training his idea, and arousing his feelings and emotions. Through this unconscious education the individual gradually comes to share in the intellectual and moral resources which humanity has succeeded in getting together. He becomes an inheritor of the funded capital of civilization." (Dewey, 1897, p.1)

Dewey felt that it was necessary to overcome the ill effects of "old individualism" and "the great society" in which alienated human relations dominate, and to build a social community in which one-on-one human relationships dominated.

"Democracy as a way of life is controlled by personal faith in personal day-by-day working together with others. Democracy is the belief that even when needs and ends or consequences are different for each individual, the habit of amicable cooperation --- which may include, as in sport, rivalry and competition --- is itself a priceless addition to life." (Dewey, 1939a, p.228)

Dewey's theories of education were closely linked to social philosophy, which he particularly discussed in his book "Democracy and Education." Dewey believed that "A democracy is more than a form of government; it is primarily a mode of associated living, of conjoint communicated experience" (Dewey, 1916, p. 94), and that "an undesirable society, in other words, is one which internally and externally sets up barriers to free intercourse and communication of experience." (Dewey, 1916, p.106) However, "a society which makes provision for participation in its good of all its members on equal terms and which secures flexible readjustment of its institutions through the interactions of the different forms of associated life is in so far democratic" (Dewey, 1916, p.106-107). That is, Dewey valued and respected individual freedom and diversity as these led to societal growth.

Dewey stated that "since it is one that can have no end till experience itself comes to an end, the task of democracy is forever that of the creation of a freer and more humane experience in which all share and to which all contribute" (Dewey, 1939a, p.230). Dewey advocated a "creative democracy" that realized its creation through shared experiences.

Dewey believed that in a democracy, dialogues, debates, and other so called "democratic" methods and a "scientific attitude," which was attitude focused on constantly improving knowledge through experiments and the sharing of this knowledge through communication, were significant. Dewey viewed a "scientific attitude" as being a "willingness to hold belief in suspense, ability to doubt until evidence is obtained; willingness to go where evidence points instead of putting first a personally preferred conclusion; ability to hold ideas in solution and use them as hypotheses to be tested instead of as dogmas to be asserted; and (possibly the most distinctive of all) enjoyment of new fields for inquiry and of new problems." (Dewey, 1939b, p.112) This view

was what led to his ideas on "inquiry," which are discussed in the following section.

### 2.3 Reflective Thinking and Inquiry

As people learn from their experiences and then make use of them in the future, experiences are not passive but are interactions; "experience does not go on simply inside a person" (Dewey, 1938a, p.39), rather, "every genuine experience has an active side which changes in some degree the objective conditions under which the experiences are had." (Dewey, 1938a, p.39). Dewey believed that "a separation of the active doing phase from the passive undergoing phase destroys the vital meaning of an experience." (Dewey, 1916, p.162) Therefore, Dewey saw knowledge as experiences that were accompanied by actions.

"To 'learn from experience' is to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence. Under such conditions, doing becomes trying; an experiment with the world to find out what it is like; the undergoing becomes instruction --- discovery of the connection of things" (Dewey, 1916, p.151)

If we learn from experiences and try to make use of these in our following experiences, we must grasp the actions and results related to those experiences in more detail. Dewey referred to this as "reflective thinking" or "deliberation," the "intentional endeavor to discover specific connections between something which we do and the consequences which result, so that the two become continuous" (Dewey, 1916, p.156). Introspective thinking allows us to determine how certain behaviors and actions are related to certain results, which then allows us to grasp what is happening and control our own actions when confronted with a similar situation.

"What he has learned in the way of knowledge and skill in one situation becomes an instrument of understanding and dealing effectively with the situations which follow. The process goes on as long as life and learning continue." (Dewey, 1938a, p.44)

Dewey emphasized that "thinking is the method of an educative experience" (Dewey, 1916, p.176), and that "the sole direct path to enduring improvement in the methods of instruction and learning consists in centering upon the conditions which exact, promote, and test thinking." (Dewey, 1916, p.164) Therefore, in education, it is important to provide opportunities to have experiences and provide time to reflect on these experiences by encouraging introspection. While reflection time is sometimes given in current education settings, it is still important to encourage the deeper introspection described by Dewey.

A more generalized view of introspective thinking is the notion of "inquiry," which is the flow of an idea that starts with doubt, proceeds into reasoning, and becomes a belief. Dewey saw inquiry as "the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of

the original situation into a unified whole.” (Dewey, 1938b, p.167)

The concept of “inquiry” was originally discussed by Charles Sanders Peirce and adopted by Dewey. Peirce’s beliefs have a unique position in the study of logic, as they were not based on psychology. As well believing in the values of induction and deduction, he also believed that the abduction of hypothesis formation was the basic logical operation for inquiry. Dewey also discussed inquiry in detail in his book “Logic.”

Inquiry begins when we encounter something new or when our beliefs in something are swayed; that is, inquiry is an indeterminate state that is initially both chaotic and contradictory, but then heads towards a calming conviction, which when reached, stabilizes. Starting from an uneasy state of doubt, the process of inquiry emerges, from which a firm state of belief is finally reached. Thinking and inquiry are therefore an “adventure” because they move forward one step at a time away from the chaos at the beginning.

“It also follows that all thinking involves a risk. Certainty cannot be guaranteed in advance. The invasion of the unknown is of the nature of an adventure; we cannot be sure in advance. The conclusions of thinking, till confirmed by the event, are, accordingly, more or less tentative or hypothetical.” (Dewey, 1916, p.159)

The “belief” obtained from the inquiry could also be classified as “knowledge”; that is, as a result of thinking and inquiry, people acquire some kind of “knowledge.” However, this “knowledge” is not absolute as it is possible that new doubts could arise through further experiences or could change as a result of further inquiry.

“The ‘settlement’ of a particular situation by a particular inquiry is no guarantee that that settled conclusion will always remain settled. The attainment of settled as not to be exposed to further inquiry. It is the convergent and cumulative effect of continued inquiry that defines knowledge in its general meaning.” (Dewey, 1938b, p.21)

Therefore, the end of one inquiry can be the beginning of the next quest as there is “continuity in inquiry” (Dewey, 1938b, p.222); “the conclusion reached in one inquiry become means, material and procedural, of carrying on further inquiries” (Dewey, 1938b, p.222). Therefore, Dewey claimed that it was more appropriate to call the result of an inquiry a “warranted assertion,” rather definitive terms such as “belief” or “knowledge” as all inquiries are based on the results of previous inquiries and are therefore cumulative.

Dewey emphasized the importance of “trials” and “experiments” to conduct inquiries to try out hypotheticals so as to move forward. He saw inquiries from the experiences of students at school and from the experiences of researchers conducting experiments to have the same continuous process; an idea that overlapped with Piaget’s ideas mentioned in an earlier paper.

“The most direct blow at the traditional separation of doing and knowing and at the traditional prestige of

purely ‘intellectual’ studies, however, has been given by the progress of experimental science. If this progress has demonstrated anything, it is that there is no such thing as genuine knowledge and fruitful understanding except as the offspring of doing. The analysis and rearrangement of facts which is indispensable to the growth of knowledge and power of explanation and right classification cannot be attained purely mentally -- - just inside the head. Men have to do something to the things when they wish to find out something; they have to alter conditions. This is the lesson of the laboratory method, and the lesson which all education has to learn.” (Dewey, 1916, p.291-292)

Dewey felt that experiments were not confined to science but that experimental trials and errors based on “materials of experience” were essential in every aspect of everyday life.

“The first stage of contact with any new material, at whatever age of maturity, must inevitably be of the trial and error sort. An individual must actually try, in play or work, to do something with material in carrying out his own impulsive activity, and then note the interaction of his energy and that of the material employed. This is what happens when a child at first begins to build with blocks, and it is equally what happens when a scientific man in his laboratory begins to experiment with unfamiliar objects.” (Dewey, 1916, p.165)

This is true of all professionals.

“Farmer, mechanic, painter, musician, writer, doctor, lawyer, merchant, captain of industry, administrator or manager, has constantly to inquire what it is better to do next. Unless the decision reached is arrived at blindly and arbitrarily it is obtained by gathering and surveying evidence appraised as to its weight and relevancy; and by framing and testing plans of action in their capacity as hypothesis: that is, as ideas.” (Dewey, 1938b, p.255)

As well as widely discussing the above teaching theory, Dewey also established a “Laboratory School” in Chicago to put his ideas into practice. He recalled an event that occurred during a trial and error cooking session.

“One of the children became impatient, recently, at having to work things out by a long method of experimentation, and said: ‘Why do we bother with this? Let’s follow a recipe in a cook-book.’ The teacher asked the children where the recipe came from, and the conversation showed that if they simply followed this they would not understand the reasons for what they were doing. They were then quite willing to go on with the experimental work.” (Dewey, 1900, p.38)

This story is true not only for children but also for adults, and is an increasingly important attitude for the creative society. Finally, we would like to quote Dewey’s following words in relation to creative learning.

“Surrender of what is possessed, disowning of what supports one in secure ease, is involved in all inquiry and discovery; the latter implicate an individual still to

make, with all the risks implied therein. For to arrive at new truth and vision is to alter. The old self is put off and the new self is only forming, and the form it finally takes will depend upon the unforeseeable result of an adventure.” (Dewey, 1925a, p.245-246)

Creating is learning, and in effect is also changing.

### 3 Pattern Language from the Perspective of Dewey's Theories

Why does pattern language take a language form? Although Dewey did not directly refer to pattern language, his quote on language answered this question as he stated that “language is the only means of retaining and transmitting to subsequent generations acquired skills, acquired information and acquired habits” (Dewey, 1938b, p.95). By using pattern languages while reflectively thinking about experiences increases “the increment of meaning” (Dewey, 1916, p.84).

Additionally, patterns hold “an added power of subsequent direction or control” (Dewey, 1916, p. 84) and therefore can be used for “introspective observation”, in terms of Kolb’s experimental Learning Cycle (Kolb, 2015), that reflects on concrete experiences; that is, pattern languages function as “glasses of recognition” because patterns provide the perspectives (abstract concepts) to recognize the important practices inherent in whole, continuous, concrete experiences.

Of the people who focus on “learning from experience,” there are some who say that rather than simply using patterns (which are already abstract and verbalized), we should do the abstraction ourselves. While thinking and viewing things from an abstract perspective is significant, as abstraction itself is a very difficult task, it is often not actioned. Therefore, using abstracted or verbalized patterns as reinforcements to experience the transition from concrete to abstract ideas may be better.

From a constructivist standpoint, in principle, it is impossible to acquire and learn from pattern languages through a simple knowledge transfer; therefore, it should be understood that all patterns need to be acquired constructively, which means that people must actually practice the patterns to acquire them. From Piaget’s description of a pattern, it is possible to construct a corresponding recognition only if it can be assimilated into our own structure or schema, and in reference to Vygotsky, neither scientific concepts nor patterns can be learned without spontaneous everyday concepts or practical knowledge.

In other words, from a constructivist standpoint, it is not possible for pattern languages to replace our experiences or interfere with our learning, which was commented on by Dewey.

“Part of his learning, a very important part, consists in becoming master of the methods which the experience of others has shown to be more efficient in like cases of getting knowledge. These general methods are in no way opposed to individual initiative and originality --- to personal ways of doing things. On the contrary they are reinforcements of them. For there is radical

difference between even the most general method and a prescribed rule. The latter is a direct guide to action; the former operates indirectly through the enlightenment it supplies as to ends and means. It operates, that is to say, through intelligence, and not through conformity to orders externally imposed.” (Dewey, 1916, p.184)

Listening to patterns as a “general method” and understanding the experiences of others as concrete examples of that pattern reinforce our acts in a similar scenario. We believe that education in the future should make use of pattern languages so that students can learn constructively by creating their own experiences.

### 4 Conclusion

This paper discussed constructivism through the pragmatic lens of John Dewey’s theories, with a specific focus on his ideas on the “principle of continuity of experience,” the “reconstruction of experience,” “school as a community,” “reflective thinking,” and “inquiry.” The value of pattern language in making “the increment of meaning” (Dewey, 1916, p.84) possible by reflectively thinking about experiences and how pattern contents hold “an added power of subsequent direction or control” (Dewey, 1916, p.84) were also discussed. In the earlier works in this series of papers, we discussed constructivist learning theories and the ideas of Jean Piaget (Iba and Munakata 2019), Lev Vygotsky (Iba and Burgoyne, 2019) and Seymour Papert (Iba and Iwata, 2019); therefore, we recommend that the reader also refer to these papers.

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