Architectural Apprenticeship, a Second View

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Abstract

Having been a pre-schooling mode of learning/instruction, *apprenticeship* is being recognized and/or re-discovered, by cognitive psychology of the recent two decades, as *the most natural way of learning* and a *powerful perspective to education*, particularly from a transfer-of-learning viewpoint. Moreover, in recent years, new forms of effective training programs have been set out, based on the very theoretical principles, with their main focus on effective training of skillful workforce in different fields.

The present paper will first review the main properties of the apprenticeship mode of education, as enumerated by cognitive psychologists, who draw a distinction between *apprenticeship* in its pre-modern tradition and what they would coin as *cognitive apprenticeship*. After a brief account of the six properties of cognitive apprenticeship (modeling, coaching, scaffolding, reflection, articulation, exploration), the supporting theories, such as Bandura's *social learning*, Lave's *situated cognition* and Vygotsky's *zone of proximal development* will be addressed, to acknowledge the effectiveness of learning through *contexts* and *cultures* as well as interaction with *peers* and/or *the more knowing others*.

The paper will, then, draw on a rather neglected component in the six-property-model of cognitive apprenticeship, whose omission delimits the guaranteed effectiveness of the method. Cognitive apprenticeship clearly focuses, by definition, on cognitive processes of the learner's mind to enhance the *knowledge* and *skills* of the apprentice, whereas evidence from apprenticeship in its traditional milieu proves the pillar of the method being identified with *attitudes* and ethics. To substantiate the latter charge, references will be given from the rigorous tradition of apprenticeship within the Persian cultural landscape, drawing on citations from some old 'Letters of Trades/Professions', named *Fotovvat-Nameh* or *Letter of Generosity*, which would serve as a professional affidavit, a declaration of a dedicative and responsible attitude towards self, profession, society and environment, under a religious value system.

The paper will conclude with evidence from the more recent research on transfer of learning, which squarely turn out to place significant emphasis on the decisive role of attitude and affection in the process of "learning transfer", so central to apprenticeship mode of training.

Keywords: Design Education (primary keyword), Ethics

1. Apprenticeship, an Overview

1.1. Background

Tracing back to the human history on this globe, the transmit and/or accumulation over generations of knowledge and skills is proved to have occurred through face to face interaction of one who lacked a body of knowledge/skills with a 'more knowledgeable and skillful' other, within the social context. That is the most natural way of education, which can be referred to as *apprenticeship*. Apprenticeship was the way one learned what they required, simply by observing, imitating and approximating a *master* or a *more knowing other*. The whole procedure being an episode of real life/job, the outcome of education was closely tuned with application requirements. It was true from learning how to wear clothes to learning the complicated levels of competence in craftsmanship as well as creative arts. "Apprenticeship is the way we learn most natural. It characterized learning before there were schools, from learning one's language to leaning how to run an empire" [1, 2, p.491]. It is in line with a definition of *education* as *the acquisition of the art of the utilization of knowledge* [3, p.6]

When it comes to complicated bodies of specialized knowledge/skills, apprenticeship is developed as a powerful social institution to establish the necessary professional conduct. The so-called 'guilds' of the medieval Europe and 'javaanmardan' of Iran (to be stated further in 2.3), are two quite different instances of the above mentioned social institution.

Apprenticeship, though, is a world's well established mode of professional training in all fields of expertise that retained its standing for centuries before it was rejected as a training method only under the modern external pressures of universal education [4].

1.2. Deficiencies

Scrutinizing why and how apprenticeship was made redundant and further replaced with academic education, is clearly beyond the scope of this paper. From an educational viewpoint, though, three aspects of traditional apprenticeship are held to have been more influential in its abolishment. Those are; 1. Being along the line of a vocation, producing things and providing services, having little to do with intellectual competencies, 2. The randomness of experiences made available to the apprentices due to restrictions of the demands in the workplace, rather than pedagogical concerns, 3. Being bound to job circumstances, although resulting in effective 'situated learning' but hardly transferable to various future application settings [1, 2, p.459].

1.3. Revision

The proposed concept of 'cognitive apprenticeship' suggested by Collins and his colleagues [1, 2], contribute to resolving the above deficiencies by; 1. Extending the scope of learning objectives beyond that of a vocational training, 2. Determining the problems and tasks given to learners due to pedagogical concerns, rather than job circumstances, 3. Extending 'situated learning' to diverse contexts so that the learner would induce the abstract principles underlying the delivered knowledge/skills, that leading to enhancement of 'learning transfer'.

1.4. Components of Cognitive Apprenticeship

Cognitive apprenticeship could best be interpreted as a revalidation of the old apprenticeship mode of education within the context of cognitive psychology of the recent two decades. Components/methods of apprenticeship

are catalogued as follows [5, pp.237-238]:

1.4.1. Modelling: Experts show their apprentices how to do tasks that are important and explain the subtleties of such tasks to their charges...

1.4.2. Coaching: The master watches the student attempt a task and offers hints, feedback, and guidance...

1.4.3. Scaffolding: The master offers support, guidance, and reminders. The master does not offer too much support, however, pulling away as the apprentice is able to function independently. Scaffolding requires great diagnostic skills on the part of the master, both determining when the apprentice is in need of help and offering appropriate redirection...

1.4.4. Articulation: Articulation is a form of testing. Masters require their apprentices to explain what they are doing. Thus, an expert maths teacher may require the tad to explain how he or she went about solving a problem and why the particular solution method was used over alternative methods.

1.4.5. Reflection: Apprentices are encouraged to compare their work with that of others, including the master and other apprentices.

1.4.6. Exploration: Apprentices cannot be mere copies of their mentors. Thus, those who mentored our scholarship did not intend that we would simply spend our careers replicating their work but would instead strike out on our own. The apprenticeship relationship permits safe exploration.

To give a rough grouping of the above six methods, the first three (*Modelling*, *Coaching*, *Scaffolding*), can be taken as the core of cognitive apprenticeship, designed to help students acquire an integrated set of cognitive and metacognitive skills through processes of observation and of guided and supported practice; the next two (*articulation and reflection*) as methods designed to help students both focus their observations of expert problem solving and gain conscious access to (and control of) their own problem-solving strategies; and the final method (*exploration*) as aimed at encouraging learner autonomy, not only in carrying out expert problem-solving processes, but also in defining or formulating the problems to be solved' [1, 2, p.481] .

1.5.   The Supporting Theories

Apprenticeship mode of education is further supported theoretically by a number of contributions to the psychology of education, of which the most promising are as follows:

1.5.1. Bandura's *social cognitive theory* concedes that learning can occur by observing others' behavior and the following consequences for them- learning through modeling and vicarious experience. He rightly acknowledges that reliance on observational learning from competent exemplars, as distinct from the behavioural dictum of *trial learning*, is vital for both development and survival. Vicarious experience prevents costly and, in some cases, hazardous mistakes [6, p.19]. By adopting the concept of *abstract modeling*, he further asserts that modeling, at the human level, is more of an abstract nature. That means learners, through the process of modeling, are able to induce the underlying rules of the observed behaviours for generating behaviors of identical structural properties, which goes beyond what they have observed [6, p.100]. Thus, contrary to the common belief, innovation can emerge through the modeling process. To give an evidence for the above account, he further draws on the fact that in most creative endeavors, the requisite knowledge and skills are learned by attending to exemplars and by practice through some form of

apprenticeship [6, p.104]. Social and interactive nature of learning is well substantiated by Bandura's *modeling* process, whose scope of meaning is interestingly extended to embrace the creative act of learning transfer, that is adaptation and application of the modeled behavior to new situations.

1.5.2. Dewey's concept of 'complete act of thought', places thinking within the context of ongoing activity, through five stages as follows; *'felt difficulty', 'observation', 'suggestion*', *'reasoning*', *' experimental corroboration, or verification*' [7-9]. It obviously interprets thinking as an *act,* rather than an in-the-head process. It involves a chain of 'generating ideas' and 'examining them', until a satisfactory conclusion is reached and the felt difficulty is resolved. In other words, real thinking involves an interaction of learner and learning situation; it is *situated*.

Dewey's contribution shares its ideals with the rather recent works on *'situated cognition',* by Brown, Collins, and Duguid [10], Lave [11], and others. Situated cognition movement advocates apprenticeship situations, where learning occurs through actual experience in real life practice. It suggests learning as being tied to activity, context, and culture, which is contrary to conventional schooling, where, concepts are removed from their natural context and application environment, and learning, based on abstract knowledge, is 'unsituated'

1.5.3. Vigotsky's concept of *ZPD (Zone of Proximal Development),* and its derivative concept of *scaffolding*, make the core of cognitive apprenticeship. Zone of proximal development, demonstrates "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" [12, p.86]. It implies that a concept can be successfully taught somewhat more than a full stage before its spontaneous appearance, and assessment of what learner does with help is more predictive of future success than assessment of what they can do without help [13, pp.188-189].

The fresh debate on the merits of apprenticeship in recent decades has led to an increasing tendency towards the adoption of the method to today's requirements of professional training, in various fields and levels. The significant number of internet search results for apprenticeship courses, and developments which promote it as a comparatively more effective and efficient alternative for the conventional academic disciplines, *"The Other Four-Year Degree"* [14, p.1], so to speak, forecast a still increasing public attention to the method in future.

2. Apprenticeship, A Second View

2.1. The Overlooked Aspect

Few might question the effectiveness and efficiency of apprenticeship learning. And more, the resurrection of the method by cognitive research contributions is quite rewarding. But, drawing a comparison between the properties of apprenticeship, as catalogued by Collins and his colleagues, with those established within the cultural tradition of Iran, will lead to spot an overlooked aspect in cognitive apprenticeship, which might be worth considering.

Scrutinizing the six components of cognitive apprenticeship reveals an underlying focus of attention on *Knowledge* and *skills* as the ultimate things to be transmitted, cultivated and enhanced, hence the added prefix (*cognitive*) for apprenticeship. But, evident in the tradition of apprenticeship (at least in the Iranian context), there is another

component which is, by no means, less important (if not more) than the earlier mentioned six components. That overlooked component has to do with ethics, with moralities, and with *attitude*.

If knowledge and skills are about *know-what*s and *know-how*s, attitude is to do with *know-why*s; it is to do with values, with affection, with orientation towards self, profession and society, and, to perceive it in a religious landscape, towards the Creator. Two evidence can be drawn on to substantiate the above charge; first, the manner of the *master builders* or *Ostad Memars*, and second, the old *letters of trades/professions*, scarcely preserved and available.

2.2. The Manner of the Master Builders (Ostad Memars)

In 1994, within the framework of his PhD research [15], the author succeeded to have a meeting with a prominent traditional memar, Ostad Mohammad Sha'arbaf, mediated by his son/apprentice Ostad Asghar Sha'arbaf, the *master* and the *apprentice*, as such. Ostad Mohammad, who passed away in 1995 at the age of near a hundred, was famous for his generosity in giving instruction to everybody whoever proved to enjoy the necessary qualifications, both intellectually and morally, to learn and practice.

"He was strictly concerned about the behaviours of his apprentices; even about the subtle points in their personal affairs", said memar Asghar about his father/*master*. "The way they dressed, their treatment with others, their tidiness, their respect for the neighbours' privacy, and even their practice of religious rituals would closely be observed by Ostad, and corrected when necessary" [15, p.250-251].

In another interview, recorded in 1986, Ostad Mohammad respectfully talked about his apprenticeship time, with his father as the master;

"When I started working for my father, I was about 10-12 years of age... From then on, my father was my instruction, my textbook, my school... He taught me well and I never took my responsibilities lightly". Then he recalled his father's recurrent advice: "Let the ground be your paper and your finger the pencil [16]."

A similar state of affairs was evident in the manner of *Ostad Reza Memaran*. This was the author's direct observation while, in 1989-1990, his then partnership was involved with design and supervision of a fairly large mosque and educational complex for Sharif Technical University in Tehran. As a highly distinguished memar, with a rich resume of diverse architectural/engineering works, from public bath to bridge, from Mosque to river dam, Ostad Reza was invited to put up a dome over the main praying area.

Ostad Reza's statement in terms of how important the moral attributes were, for the admission of an apprentice by a master, was supported by his own manner at work. Discipline, order, and commitment to perfect work were dominant in his team. While occupied with the sensitive inspection of his apprentices working on the dome, he would not overlook wasting material by a simple worker and he would shout, in a kind manner, to advise him not to throw away some broken bricks (what might seem trivial, compared to the responsibilities of a memar of his rank). If there is an accepted principle as to nothing should be wasted, then it must seriously be respected even by a simple worker, let alone the apprentices. This very simple reaction reveals a holistic view of training that recognizes the merit of a responsible attitude towards *environment* with its full meaning. This *attitude*, which is obviously beyond

knowledge and skills of building, is deep rooted in culture and tradition of religious origin [15, p.251].

2.3.   The Old Letters of Trades/Professions (Fotovvat-Nameh)

To perceive some of the cultural roots of the above account the second evidence would be the old "Letters of the Trades/Professions". These *Letters*, in the Persian culture, are among booklets called *Fotovvat-Nameh*, meaning *Generosity Letter*. The history of these letters, which served as professional affidavits, can be traced back to the Iranian liberation movements such as *'Javanmardan'* (the generous young), that were formed and flourished to support the poor mass of people who had most suffered from invasions such as that of the Moguls [18]. To substantiate the point raised as to the significance of *attitude* in the tradition of professional apprenticeship, citations will be made from the few available sources [17-22].

A common characteristic of such texts is that they attribute the origin of each trade to one of the prophets or holy religious leaders, and more, the means and tools of the trade are also associated with divine relations. The art of fabric printing, for instance, is attributed to the prophet Lot [17, p.233], and the art of building is associated with the prophet Abraham who first constructed the Ka'aba, in Mecca, as a place of worship [18]. The dying vat was found in the time of Noah [17, p.238], and the mould for making mud bricks is from the Paradise. "If they ask where the mould has come from, tell its wood is from the Paradise, and it is box-wood" [18]. Even the colours are not simply 'warm' or 'cold'; they are value-laden, some from the Paradise, some from the Hell. The *meaning* and *orientation* is always there. Under such a value system, the subtleties of master-apprentice relations can be explicated.

2.4.   The Master - Apprentice Relations

Scrutinizing the subtleties of the master-apprentice relations within the culture of *'Javanmardan',* reveals the essential goal of the process of *give and take* as being the moral transcendence of the apprentice, to which the mastery of techniques was a subordinate [19, p.58]. The master's responsibilities as well as the apprentice's endowments are cited next from two such *Letters*, needless to mention that the beauties of such literary texts are hardly transferable to a second language.

2.4.1.   The seven fold duties/responsibilities of the master towards his apprentices, in a Generosity Letter (*Fotovvat-Nameh),* by the Persian scholar Shahabeddin Sohravardi, reads [20, pp.56-57]:

2.4.1.1.   The master should be concerned about the right doing of his apprentice, whether be present or absent. If a master lacks such an affective attitude, he is not a real master.

2.4.1.2.   The master should all the time be concerned about education of his apprentice, helping him to approximate the master's position.

2.4.1.3.   The master should always have a generous, compassionate and benevolent hand.

2.4.1.4.   The master should examine his apprentices in offering help and support to each other.

2.4.1.5.   The master should spot the potential capabilities of each individual apprentice, and realize the most befitting area of competence for them.

2.4.1.6.   The master should nurture, in his apprentices, the competency of adopting proper behaviours due to others' level of moral capacity; in cases they bear, in turn, a message for other apprentices.

2.4.1.7.   The master should never forget his apprentices, particularly in times of worship and praying, wishing for

them firm beliefs and consciousness about their shortcomings.

2.4.2. The apprentice's required endowments are demonstrated in *Fotovvat-Nameh-ye Soltani* (Generosity Letter of Soltani), in the form of questions and answers [21, 22, p.100];

If they ask on what the apprenticeship is founded, say on devotion.

If they ask what the devotion is, say listening and obedience.

If they ask what the listening and obedience is, say to attend by existence, to admit by heart, and to perform by organs.

If they ask what the best thing is for the apprentice, say pure belief. Everybody who achieved his goal, it was by pure belief.

If they ask how the apprentice could approach his ideals, say through attendance.

If they ask what the foundation of attendance is, say on leaving indolence and tolerate difficulties.

The texts enjoy abundant signposts showing the highly value-oriented nature of commitment to a profession, at the heart of which being *generosity;* the degree to which one is prepared to sacrifice one's self for the welfare of others, hence the ethical ground of apprenticeship.

2.5. The Concluding Remark

Incorporating the above account in the previously mentioned components of apprenticeship, it can now be suggested to look like this [15, p.253]. : *Modeling, Coaching, Scaffolding, Articulation, Reflection, Exploration,* and the last but not the least *Attitude formation* It has to do with *Ethics* which is defined as the science of *morals* and is concerned with the principles of human *duty*. The latter component exacerbates the decisive role of the coach, tutor, teacher, or at best *master* in the educational environment, not in that he teaches, but rather in his presenting the exemplar of the values. "If they ask what the *prior* thing is in this trade, say, first the *master's attention* ..." [17, p.239].

The above account is quite reasonable in a place like Iran with a long history associated with religious faith and Gnosticism, but since religion is the historical spring from where the streams of cultures and traditions have originated, it is hardly surprising to witness a similar state of affairs even in the West.

In his *Ethics and Architecture*, Cobb criticizes the state of affairs in architectural education and profession, and brings the moral values and human duties to the fore as missing points in due course. "Indeed, serious probing of ethical questions has been virtually taboo in contemporary architectural discourse, largely because it is presumed to be impossible to talk about morality without moralizing; and it is well established that moralizing is the death of art. Yet a head-in-sand attitude toward the ethical dimension of architecture has, in my view, significantly diminished the art of architecture in our time [23].

Palmer's statement as quoted by Argyris and Schon is more telling. They write [24, p.146]: "Clearly, what we now call the professions have their origins in religion". Then they quote Palmer as pointing out: "A professional, as I understand it, is supposed to profess, to testify, to bear witness to some sort of faith or confidence or point of view. Traditionally, at least, it was only because he did so that he merited being called *professional*. I would argue that in the traditional view, a professional was religious by definition." Then Palmer contrasts the present day professionals

with their predecessors: "They see themselves not as bearers of a faith or proclaimers of a confidence, but as practitioners of technique... pure, empirical, pragmatic, marketable technique... [that] admits of no need of faith" [23, p.148].

2.6. The Afterthoughts

So far, the argument went on to complement the *cognitive apprenticeship model* of Collins and his colleagues by introducing to their six fold attributes of cognitive apprenticeship, a seventh component as *attitude formation*, which is particularly valid if the model is to be applied or transferred to professional education, such as architecture, where the professional's *duty*, and their *responsibility* towards the users as well as environment is of fundamental importance. That was done by drawing on some documents dealing with the culture of apprenticeship in Iran. The emphasis of the paper on attitudinal/ethical attribute of professional education was further reinforced by two citations from authors from different context. There is another line of argument through which seems worth scrutinizing in a separate enquiry. That is the emerging ideas in transfer of learning research, which clearly supports the decisive role of affections, feelings, and beliefs in the course of enhancing the transfer of knowledge/skills to future application situations, so central to professional education. The author will suffice it to draw on tow citations from Haskell's contribution to the *transfer of learning* debate [25], to touch the afterthoughts;

"I wish I were a better man and had a better mind; the two are really the same thing." Ludwig Wittgenstein.

To reveal the subtle meaning of Wittgenstein's statement, Haskell gives a definition of his *good man.*

"The *good man*, then, is the person who *firmly believes* in what he or she is doing, who is in a state of strong emotion and *feeling,* which, as we have seen, leads to a more complex encoding of their learning. Thus, everything she or he sees and thinks is encoded in an integrated cognitive way into the personality and emerges in an integrated form" [25, p.129].

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