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THE IMPACT OF INDUCTION ON KHALDUNIC EPISTEMOLOGICAL CURRICULUM

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Abstract

Ibn Khaldūn (1332-1406) had personal visions and theories concerning epistemology and education. He had a role in building societies and defining the role of education in civilization, thus influencing history. His contributions to educational curriculum predate educational scholars. The aim of this study is to examine Ibn Khaldūn's Epistemological Curriculum and the influence of induction on the curriculum, based on his book 'Muqaddimah Ibn Khaldūn.' This study adopts the analytical textual method to analyze the Muqaddimah and deduce the role played by induction in the formation of his theories. This research is original in nature contributing in building a bridge between the philosophy, education, and social sciences.The paper begins by presenting Ibn Khaldūn's notion of epistemology. This is followed by a discussion of his classification of knowledge, his educational pedagogy, and the influence of induction on his epistemological and educational theories. The research concludes by examining selected excerpts from the Muqaddimah which assist in determining the role of the inductive method in Ibn Khaldūn's epistemology.

Keywords: Ibn Khaldūn, Induction, Epistemology, Curriculum, Classification of Science, Educational Pedagogy.

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1. Introduction

Philosophical dictionaries define epistemology as the sum of meanings, beliefs, values, notions and thoughts that are formed as a result of an individual's constant attempt to understand the surrounding world (Jihami, 1998; Khalīl, 1995; Ṣalībā, 1982). Put differently, epistemology is the understanding of phenomena as a result of induction and an awareness of nature and society.

Early philosophers held independent views on epistemology. For example, the Sophists considered the five human senses as a source of knowledge, whereby the amount of knowledge gained depends on the aptitude of these senses. Socrates opposed this view believing that the intellect is the only source of knowledge. He attributed his opinion to the supposition that there is an ideal world that may not be recognized through the human senses (Badawī, 1980, pp. 21–22) Furthermore, Plato claimed that knowledge is of four types: sensory, suppositional, deductive and rationalistic. He defined knowledge as the complete recognition of reality. Plato believed that the real world is the ideal one which is beyond the reach of humans, whereas the sensual world is merely a reflection of our thoughts from which knowledge emerges (Stockhammer, 1965, pp. 145–146, 230–231) Aristotle agreed with his teacher that true knowledge is the acquaintance with universal knowledge. However, he disagreed with the claim that universal images can only be found in the ideal world. Aristotle believed that knowledge is acquired through sensory experience and objective rationalism (Kiernan, 1962, pp. 316–320, 438–441).

As for the epistemological theories of Arab philosophers, they are often influenced by Greek theories. Al-Kindī is considered the first Muslim philosopher to examine epistemology. He neither rejected sensual knowledge nor considered it the only source of knowledge. Unlike Plato, he integrated sensation and rationalism but prioritized rationalism (I., 1950, pp. 106–112, 321–353; Saif, 1985, pp. 128–132; Shāh Walī, 1974, pp. 410–424);. Al-Fārābī claimed that knowledge is of two types: sensational and rational. In sensual knowledge, images of sensed objects are recognized through the five senses, while rational knowledge is the recognition of universal constants through the mind (Al-Fārābī, 1988, pp. 37–52, 366–391) According to Ibn Sīnā, all knowledge begins with the senses. It then matures according to the power of the inner-self-directed by the mind. Epistemology is divided into three ranks: the epistemology of prolegomena, the epistemology of abstract meanings and the epistemology granted by Allah through mysticism, such as predicting the future. Unlike al-Fārābī, Ibn Sīnā divided recognition into sensual recognition that is acquired through the senses, and intellectual recognition that is represented in the form of logic devoid of matter (Ibn Sīnā, 1985, pp. 196–231, 1993, pp. 150–192, 220–226).

Furthermore, al-Ghazālī classified epistemology into sensual, intellectual and that which is known through mukāshafah (revelation/detection/inspiration). The third type he considered to be true epistemology that is understood with the heart without the interruption of the senses. The superior level of epistemology, according to al-Ghazālī, is not that which is known through the mind, but the knowledge gained through Sufism (m. m. Al-Ghazālī, 1997, p. (2), 28-39, (3), 57-74, (7) 56-70; M. M. Al-Ghazālī, 1986, pp. 165–171). In contrast to al-Ghazālī, Ibn Rushd believed that recognition is known through the

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senses. He divided recognition into sensual and intellectual. Ibn Rushd claimed that it is only the mind that can recognize universal meanings (Ibn Rushd, 1947, pp. 10–93; Mansiyyah, 1999, p. (1) 263-277).

2. Problem statement

Ibn Khaldūn showed great interest in knowledge and epistemology. He devoted chapter six of the *Muqaddimah* in its entirety to a detailed discussion of his epistemological theories. Despite the clear importance Ibn Khaldūn attached to the issue, it is rather curious that despite the breadth of studies on Ibn Khaldūn, little attention has been paid to his method of forming his theories on epistemology.

The literature on Khaldunic studies entails different attitudes toward his works. While some considered him as a typical Aristotelian philosopher who had no original contribution toward the philosophical epistemology (Al-Azmeh, 1982; Gibb, 1962; Mahdi, 1957), others considered him a spectacular thinker and the founder and pioneer of social sciences who emerged from the Islamic world (Baali, 1988; Bouthoul, 1930; Conyers, 1972; Dhaouadi, 1990; Nicholson, 1966).

By reviewing Khaldunian studies, it is observed that research on Ibn Khaldūn's epistemological theories is limited to four main aspects:

- Actual Studies: Supporters of this tendency focus on the social aspects of Ibn Khaldūn's epistemology. Essentially, they tend to discuss Ibn Khaldūn's theories according to his environment. Among such proponents is Ṭaha Hussain in his book '*Falsafat Ibn Khaldūnal-Ijtimāᶜiyyah*' and Nāsīf Nassār in his book '*al-Tafkīral-waqiᶜī ᶜinda Ibn Khaldūn*.'
- Subjective Studies: Some researchers have focused on explaining Ibn Khaldūn's epistemology in various fields of science and showed how many of his theories predated the contributions of early and contemporary sociologists and philosophers. One such researcher is Fāṭimah Badawī who wrote '*Beyond Science as a Vocation: Civilization Epistemology in Weber and Ibn Khaldūn*' Another is Seyed Farid al-Attas who has done many subjective studies on Ibn Khaldūn's theories among them the theory of luxury, state and society and Eurocentrism (Alatas, 2017; Ardıç, 2017). He focused on how to apply the Khaldunian framework to the history of Muslim societies (Alatas, 2006). Other studies which tried to re-articulate the Khaldunian studies in a manner that is compatible with modern sociology (Ahmad, 2004; Al-Marzouki, 2006; Dale, 2006; Hourani, 1982; Mahdi, 1957); There are also those who compare Khaldunian theories with Western theories like Machiavelli, Marx and Engels, Comte, Weber and Durkheim, especially in terms of politics and economy(Ardıç, 2008; Baali, F., & Price, 1982; Gellner, 1975; Goodman, 1972).
- Oriental Studies: This aspect includes some orientalists who are prejudiced against Islam and Arab researchers who were influenced by those orientalists and followed their methods. (Hannoum, 2003).
- Theological Studies: Researchers from this group explained Ibn Khaldūn's epistemology within the context of Islamic theology. Such researchers include Muṣṭafã al-Shak'ah with his book '*al-*

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Usus al-islāmiyyah fīfikr Ibn Khaldūn wanaẓariyyātih' and Ṣālih bin Ṭāhir Mashush who wrote his PhD thesis '*Athar al-naẓrah al-kawniyyah al-tawḥīdiyyahfī Siyāghat ᶜilm al-ᶜimrān al-Khaldūnī: Dirāsahtaḥlīliyyahlīmafhūmay al-insānwaal-maᶜrifahfī "al-Muqaddimah."* One of the great recent work on Khaldunian theology is the work done by Caksu (2017) entitled "*Ibn Khaldūn and Philosophy: Causality in History*". The author tried to display an aspect of Ibn Khaldūn's interest and relation to philosophy and discussed his conception of causation and analyzed how it works in his history.

Despite the plethora of available research on aspects of Ibn Khaldūn's theories on epistemology, the methodological features of his theories, especially concerning the role of inductive reasoning in the formation of his epistemological theories, are yet to be studied in detail. This study aims to explore the methodological aspects of Ibn Khaldūn's theories of epistemology.

3. Research Questions

For the better understanding of the impact of induction in Ibn khaldun's epistemology, this study is going to address the following questions:

1. What is khaldunic epistemology?
2. How ibn Khaldun classified the sciences through his induction?
3. What is the role of Induction on Ibn Khaldūn's educational pedagogy?
4. What are evidences that support Ibn Khaldūn's process of Inductive Reasoning?

4. Purposes of the Study

The major purpose of this study is to prove the impact of induction on Khaldunic epistemological curriculum. The current research specifically aims to:

1. To identify the khaldunic epistemology.
2. To explore the ibn khaldun's classification of sciences according to his inductive method.
3. To find out the role of induction in his educational pedagogy?
4. To provide evidences which support Ibn Khaldūn's process of Inductive Reasoning.

5. Research Methodology

This study will be combining the different types of qualitative methodology which suit the topic and that can help to achieve the study objectives and answer the study questions. Thus, this study is using an analytical methodology through which the researchers try to create a comprehensive approach of Ibn Khaldun's epistemology. Furthermore, the study is using the inductive method in order to explore the role of induction on his educational curriculum among them his classification of sciences, his educational pedagogy, and his educational theories.

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6. Findings

6.1. Khaldunic Epistemology and Induction

Although Ibn Khaldūn's view of epistemology is considered philosophical and logical, it is somehow different from other Arab philosophers perspectives since it is closely related to the actual and social standpoint. His main objective for discussing epistemology in the *Muqaddimah* was to prove that the human mind has the ability to understand the maxims of life through the induction of nature. This shows that his theory of epistemology is not purely logical or limited to philosophy but is a living theory that benefits human society. His theory is based on the induction of existing phenomena occurring in the world to generate beneficial social rules leading people to advance at epistemological and social levels. This results in the creation of civilization.

Based on his induction, Ibn Khaldūn introduced a comprehensive understanding of the world by providing three classifications (Ibn Khaldūn, 1979, pp. 337–339)

- The Concrete World which people can recognize through the senses. Knowledge obtained from this world is mental and is usually acquired through the outer environment, experiments and experience. The human intellect receives knowledge and is divided into three groups (Ibn Khaldūn, 1979, pp. 333–334):
  - Discerning intellect: This kind of thinking mostly consists of perceptions. It is through the discerning intellect that man obtains the things that are useful for him and his livelihood, and repels the things that are harmful to him.
  - Experimental intellect: This type of thinking provides man with the ideas and behavior needed to interact with and lead his fellow man. It mostly conveys apperceptions, which are obtained one at a time through experience until they have become very useful.
  - Speculative intellect: It provides knowledge, or hypothetical knowledge, of an object beyond sense perception without reference to practical activity. The end of the process is meant to offer the perception of existence as it is, with its various genera, differences, reasons, and causes. By thinking about these things, man achieves perfection in his reality and becomes a purely intellectual and perceptive soul.
- The Formative World which is a spiritual world where minerals, plants and animals are gradually formed and linked to each other. The last mineral formed is linked to the first plant formed, and the final plant formed is linked to the first formed animal. This is a process through which human beings were created. Knowledge in this world is perceived through the soul, which can be linked to the supernatural world through continuous practice, acquisition or dreams. However, knowledge gained through such avenues is not accepted unless it corresponds to actuality.
- The Realm of the Angels which is a spiritual world based on pure perception and absolute intellection. Ibn Khaldūn believed that the human soul must be prepared to exchange humanity for angelism in order to become part of the angelic species, even for a single moment, after which

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he/she will resume humanity. That is the meaning of revelation addressed by the angels. All prophets possess this predisposition. In exchanging their humanity for angelism, they fall under strain and experience a choking sensation. Their supernatural knowledge is one of direct observation and vision.

Consequently, according to Ibn Khaldūn, epistemology is derived from two sources: a materialistic world recognizable through the mind that collects data through the senses, and a spiritual world which is perceived by the soul without the influence of matter. In other words, unlike other philosophers, Ibn Khaldūn believed that whatsoever is categorized under sensation can be directly and comprehensively perceived by the intellect, whereas anything beyond the reach of the senses may not be recognized.

Furthermore, Ibn Khaldūn seems to have appreciated epistemology more than many other philosophers. He considered knowledge as the means by which incidents are organized and as a source from which reasons and causes are derived. He held that knowledge organizes people's actions. The more reasons and causes derived in epistemology, the greater the heights humanity attains. Some people derive only two or three levels for reasoning while others derive none, yet there are still others who may end up with five or six levels, indicative of an elevated sense of humanity (Ibn Khaldūn, 1979, pp. 1010–1011) So here the role of induction on Ibn Khaldūn's epistemology is clear because the induction phenomenon with the incidents to derive reason and cause to generate natural principles and human rules is the aim of the inductive method.

Ibn Khaldūn's research on epistemology focused on the experimental intellect, that is, the cornerstone of the inductive method. He supposed that every aspect could be comprehended through experience. Cons and interests, as well as wrongdoings and good, can all be recognized by means of experience. Each human being can gain knowledge with the help of their experience with other human beings. The knowledge derived thereof will help determine the best methods and means of human interaction. This manner has the potential to acquaint people with the entire variety of human experiences. However, this would obviously take time and experience ((Ibn Khaldūn, 1979, p. (3) 336-337).

6.2. The Impact of Induction on Ibn Khaldūn's Classification of The Sciences

One of the Khaldunic epistemological aspects is Khaldūn's classification of the sciences. He categorized the various sciences existing in his time by examining and inducting his society. His approach and description of the sciences reflect his profound experience and broad knowledge of each science. This is a good indication of his precise inductive method in collecting data. Ibn Khaldūn often went beyond a mere description of each science and mentioned how it was established, its evolution, standards, principles, features, renowned scholars and famous books. Following this, Ibn Khaldūn would then discuss the main issues of each science and provide a scholarly commentary in addition to questioning the possibility of applying some of those sciences in theory or practice. It is largely due to this approach that European scholars consider him a contemporary empiricist and positivist (Cranmer-Byng, 1950, pp. 14–15)

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Ibn Khaldūn divided the sciences according to his inductive method into two main types (Ibn Khaldūn, 1979, pp. 343–344)

- **Intellectual (philosophical) sciences**: the ones with which man can become acquainted with the very nature of his ability to think and to whose objects, problems, arguments, and methods of instruction he is guided by his human perceptions.
- **Forensic (Islamic) sciences:** traditional and conventional sciences, all of which depend upon information based on the authority of Islamic law. In such sciences, the intellect may only be used in connection with them to relate problems with basic principles.

Ibn Khaldūn began classifying Islamic sciences, which he believed through his induction were based on reliable information derived from the Qur'an, the Sunnah and the Arabic language. Each of these sciences is further classified into the following various related fields, all of which he studied in detail ((Ibn Khaldūn, 1979, pp. 344–371):

– Qur'ānic Sciences: include the science of Qur'ānic recitation (i.e., *Qirā'āt*); the science of the ʿUthmānī script (i.e., the script in which the Qur'ān is written); exegesis; the settings and circumstances of the revelation (known in Arabic as *asbāb al-nuzūl*), etc.

– The Sciences of Ḥadīth: such as Ḥadīth terminologies, *al-jarḥwaal-taᶜdīl* (science of discrediting and accrediting Ḥadīth narrators) and *al-nāsikhwa al-mansūkh* (abrogating and abrogated Qur'ānic verses)

– Sciences of the Arabic Language: such as linguistics, grammar and morphology, literature and poetry

– The Science of the Principles of Jurisprudence

– The Science of Islamic Jurisprudence

– The Science of Monotheism

– The Science of Speculative Theology

– The Science of Sufism

– The Science of Interpreting Dreams

On the other hand, intellectual sciences are mainly based on the intellect, through which humans, with their ability to think, search for answers to natural phenomena and by which they can differentiate between what is right and what is wrong. This branch of science is called philosophical science. According to Ibn Khaldūn's induction, it includes seven different fields which are organized according to the significance and priority attached to each by Khaldūn himself:

- Logic

– Arithmetic: including calculation, algebra, inheritance law, and business arithmetic (transactions).

– Geometry: including architecture, surveying and optics.

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- Astronomy: including the science of astronomical tables, and the science of stellar judgment (astrology).
- Music.
- Natural science (physics): including medicine and agriculture.
- Metaphysics.

One of the evident aspects in Khaldunic inductivity is the invalid sciences. Ibn Khaldūn believed there are a number of so-called rational sciences that are invalid from theoretical, practical, and *Sharīʿah* perspectives, for instance: The Science of Sorcery and Talismans, Semiology (the secret of letters), Astrology, Alchemy, and Philosophy (Ibn Khaldūn, 1979, p. 405)

Ibn Khaldūn's detailed critique of the different branches of science shows he was acquainted with the sciences existing during the 14th century. This would not have been possible except through induction.

6.3. The Impact of Induction on Ibn Khaldūn's Educational Pedagogy

6.3.1. Pedagogy as An Independent Skill

Ibn Khaldūn used his inductive method to investigate successful educational methods. He considered education an independent occupation that requires deep understanding and comprehension. He supported this with three arguments:

- There is a need for skills and experience within education as well as by scholars who are concerned with the fundamentals of their field, its principles, how such things are derived along with the ability to differentiate between what is necessary and secondary in education. Ibn Khaldūn referred to these skills as 'Habit' which is different from understanding and knowing by memory. Understanding a single problem in a single discipline may be exhibited equally by someone well-versed in the particular discipline and by a beginner. Habit, on the other hand, belongs solely and exclusively to the scholar or the person well-versed in scientific disciplines (Ibn Khaldūn, 1979, p. 340)
- Scientific instruction is a craft expressed by the differences in technical terminologies. Every famous authority has their technical terminology for scientific instruction, as is the case with all crafts. This indicates that technical terminology is not a part of science itself. If it were, it would be one and the same with all scholars (Ibn Khaldūn, 1979, p. 340).
- The third evidence is the inseparable relation between education and civilization. The more civilized countries are, the stronger its education and vice versa. That is why civilized people are often more skillful in industrial fields and science development. On the other hand, sciences rarely progress during the decline of civilizations (Ibn Khaldūn, 1979, p. 343).

6.3.2. The Pedagogy of School and Higher Education

Ibn Khaldūn's inductive method is also expressed through his interest in child education. He devoted an entire section in the *Muqaddimah* (chapter 6, section 40) to a detailed discussion in which he pointed out

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various methods of child education. Through his inductive observations, Ibn Khaldūn noted that during his time there were different methods of teaching and various curriculum structures for children's education in different Muslim cities. According to Khaldūn, teaching varies according to location and study program. His findings are based on his induction and study of the educational systems in Morocco, Andalusia, cities within Africa, and cities in East Arabia.

Ibn Khaldūn discussed this issue using scientific presuppositions based on tentative hypotheses that show his inductive reasoning very clearly, for instance, by asking the question: What is the best method of child education? He stated more than one hypothesis which was, in fact, the common methods applied during his time. Some of the methods are ((Ibn Khaldūn, 1979, pp. 421–424):

- The Moroccan Method: This method focuses solely on teaching the Qur'ān without reference to related sciences, such as Qur'ānic exegesis, Islamic jurisprudence, etc. It includes learning how to write, recite and memorize the Qur'ān.
- The Andalusian Method: Focus is on memorizing the Qur'ān and reciting it correctly with *tajwīd* (intonation) besides other sciences like Arabic, writing, poetry and letter writing.
- The African Method: This is a mixed mode, whereby the initial focus is on the Qur'ān by reciting, memorizing, and studying the different readings of the Qur'ān. This is followed by the skill of writing. Instruction is then directed to the sciences of Ḥadīth, followed by scientific studies.
- The East Arabian Method: This is also a mixed mode, but Ibn Khaldūn is not convinced of its focus. Nevertheless, he acknowledged their interest in Qur'ānic studies. They also taught calligraphy in private classes, as these had rules that differed from other sciences.

Ibn Khaldūn discussed each of these methods, respective methodology, and application. However, he did not seem satisfied with any of these methods. His continuous search led him to the method of Abu Bakr Ibn al-'Arabi, which he considered the best method for teaching children. Abu Bakr Ibn al-ʿArabī was a famous judge who believed that students should be taught language and mathematics before Qur'ānic, religious, and other intellectual sciences. He believed this order assists children to better understand the Qur'ān. Abu Bakr's proposed curriculum subsequently includes the study of the fundamentals of Islam, Islamic jurisprudence, argumentation, and Ḥadīth. Ibn Khaldūn preferred Abu Bakr's method and considered it the best way of teaching children. Despite this, popular customs and traditions did not support Abu Bakr's proposed method, which ultimately aims to achieve a better understanding of the Qur'ān. Eastern and Western Muslim communities were looking toward studying the Qur'ān as a means of blessing and rewards and were therefore afraid if their children missed out on early Qur'ānic education. Thus, through the inductive method, Khaldūn criticized the common methods and accepted only one method of educating children.

As for higher education, According to Ibn Khaldūn's induction, education techniques are applied gradually and not at one time. Lectures should be given at three levels (Ibn Khaldūn, 1979, p. 416):

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- Summarization: The teacher provides students with a summary of the fundamentals of a certain subject including the main issues concerning it. The teacher should consider his ability and readiness. In this manner, students will develop proficiency in that field.
- Elaboration: At this level, teachers should deliver detailed lectures to students including controversial issues and different aspects of the field which would further the students' proficiency.
- Critique: At this stage of learning, the teacher should clarify for students any ambiguity, difficulty or vagueness in any aspect of the field. This will grant students a critical proficiency (habit) by which they can differentiate between what is wrong and what is right.

Ibn Khaldūn considered this to be the most effective and successful education method and criticized teachers who neglected such a system (Ibn Khaldūn, 1979, pp. 416–417). However, he stated that depending on the level of disposition and qualification, some students might not need to undergo this means of learning. The curriculum and teachers should consider the mental abilities of their students. If this is overlooked, confusion is likely, which can lead to despair.

6.3.3. Focusing on One Specialization and Conversation and Debate as a Pedagogical Method

According to Ibn Khaldūn's experience with education and his observations of educational methods, a good method of instruction is not to expose students to two subjects at the same time. An exception is those students who have adequate intelligence and energy to manage this. Otherwise, they would rarely master a single science owing to the division of their attention between both and getting distracted by attempting to understand the other. This could cause them to fail to master either or both sciences. Focusing on one subject often makes it easier for students to learn and master it.

Besides, Ibn Khaldūn believed that every subject has a scope and the teaching of a subject should be within its scope. According to Khaldūn, the teacher should not ask more from students than what is contained in the subject. The discussion should not go beyond the scope of that subject. Matters related to the scope of the subject can be discussed only after the students have a thorough understanding of the problems and ideas the subject contains. Only when students have acquired a scholarly habit in that subject can they proceed with learning a second science.

In this context, Ibn Khaldūn recommended that teachers present a subject through consistent teaching material suited to their capacities. This assists with understanding the subject. Students should completely assimilate the subject before passing their knowledge on to others ((Ibn Khaldūn, 1979, pp. 417–418).

As for the conversation and debates Ibn Khaldūn believe that students should discuss, argue and debate scientific issues because it is the most straightforward way to achieve habit. He believed that students could enrich their knowledge and experience through such discussions. Such forums clarify the importance of the sciences and promote better understanding. However, those students who do not consider

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Ibn Khaldūn's suggestion and are concerned with memorizing, do not obtain many habits in the practice of science and scientific instruction. Some may think they have achieved habit, but when they engage in a discussion or disputation, their scientific habit is found to be defective. The only reason for their deficiency is lack of instruction, together with the break in the tradition of scientific instruction that affects them. Memorized knowledge may indeed be more extensive than knowledge of other scholars if the concern lies in memorizing, but such students may erroneously think that scientific habit is identical to memorized knowledge (Ibn Khaldūn, 1979, pp. 340–341).

6.3.4. Foundation Courses and Supporting Courses and Excessive References and Abridgment

Ibn Khaldūn's inductive method provides another categorization of science which is based on his peculiar perspective. Based on his induction and experience with existing sciences, he arranged the sciences into two major groups: self-intended (wanted per se) and non-self-intended (auxiliary). Sciences that are intended on their own include religious sciences, such as Qur'ānic exegesis, Ḥadīth (prophetic traditions), jurisprudence, speculative theology, and intellectual sciences, such as physics and metaphysics. In the case of the self-intended sciences, Ibn Khaldūn deemed there was no harm in discussing the science and treating problems in detail, or presenting all the evidence and views concerning it. On the other hand, auxiliary sciences are instrumental to the self-dependent sciences. Among the auxiliary sciences are Arabic philology, principles of jurisprudence, logic and arithmetic (Ibn Khaldūn, 1979, pp. 420–421).

Like other scholars, Ibn Khaldūn considered that books and educational resources are essential in the educational system. Nonetheless, his induction on students' abilities has led him to conclude that such resources can be harmful when they are abundant because it is impossible for students to master the habit of a science if they are required to use too many references and terminologies. With numerous books to use, students are required to have ready knowledge of all their content and observe the methods and terminologies applied in all books. However, an entire lifetime would not suffice to know all the literature on a single subject. According to Ibn Khaldūn, excessive references and textbooks are detrimental because it leads to confusion and poor understanding of a particular subject, especially complex subjects (Ibn Khaldūn, 1979, pp. 414–415).

On the other hand, Ibn Khaldūn believed that excessive abridgments are also detrimental for students. The use of abridged texts results in poor teaching and ineffective learning, resulting in inferior habits. This is because an idea or gaining knowledge of a subject is a systematic process that requires logical and gradual argumentation as well as clarification of the terms and concepts, which may result in lengthy explanations. The initial purpose of abridgments was to make it easy for students to acquire expert knowledge of scholarly subjects, but the result is that it has become (more) difficult because they are hindered from acquiring useful and firmly established habits (Ibn Khaldūn, 1979, pp. 415–416).

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6.3.5. No Force on Students and the Relationship between the Duration and Quality of Education

In Ibn Khaldūn's view, strictness with students is damaging to the process of learning. Being harsh with students will lead to the acquisition of blameworthy habits, such as laziness, insincerity, lying, deceit and trickery, which become part of their character and personality. Consequently, they would lose the qualities that relate to the social and political organization and would become dependent on others (Ibn Khaldūn, 1979, pp. 424–425).

In section eight of chapter six, Ibn Khaldūn considered the inverted relation between the quality of education and duration of learning. In other words, the better the curriculum, the shorter the period of education required. He claimed that this view was the result of his induction to his society. Ibn Khaldūn provided two models of learning: the Moroccan model, in which students take many years to receive their academic degrees due to the weakness of the education system; and the Tunisian model, which is a good model that does not exceed five years. Also, according to Ibn Khaldūn, in Morocco, the period specified for the residence of students in college is sixteen years, while in Tunis it is five years. In Morocco, the duration is lengthy because the poor quality of scientific instruction makes it difficult for students to acquire scientific habit (Ibn Khaldūn, 1979, p. 341).

Besides, Ibn Khaldūn believed it necessary for the teacher to avoid prolonging the period of instruction in a subject. Students should have short rather than lengthy breaks between sessions. He claimed that if there are lengthy interruptions between sessions, students will forget what the teacher has taught, thus confusing the relationships between the different problems of the subject being studied. The result of such interruptions is that mastery of the discipline becomes difficult. However, if a single science is continuously practised, the student will master the science and develop habits (Ibn Khaldūn, 1979, p. 417).

6.4. More Evidence Supporting Ibn Khaldūn's Process of Inductive Reasoning

The epistemological theories identified in this paper have been discussed with the aim of highlighting the influence of inductive reasoning in their development. It is also important to point out some other main passages from Ibn Khaldūn's *Muqaddimah* which represent his epistemological method:

- Ibn Khaldūn used the inductive method to prove his theory that "sciences usually grow when civilization grows." To prove this theory, he selected famous places such as Baghdad, Cordoba, al-Qayrawan, al-Basrah, al-Kufah, and Cairo as case studies (Ibn Khaldūn, 1979, p. 343).
- Ibn Khaldūn believed that even in theological studies, every hypothesis should be tested repeatedly. For example, in the section where he discussed dialectic theology, he pointed out that "an attribute is not obtained from knowledge alone. There must be an action, and it must be **repeated innumerable times**. (Only) this results in a firmly rooted habit, in the acquisition of the attribute and real knowledge." (Ibn Khaldūn, 1979, pp. 351–352).

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- Ibn Khaldūn asserted that the method of induction should be used even in metaphysical issues. When he discussed the issue of '*karamāt*' (divine grace), he affirmed that we should make an induction of whether something truly happened or not. Through induction, he believed that divine grace could not be disapproved while "the world of existence attests the occurrence of many such acts of divine grace. Their disapproval would be a kind of negative approach. Many such acts of divine grace **were experienced** by the men around Muhammad and the great early Muslims. This is a well-known and famous (fact)." (Ibn Khaldūn, 1979, p. 366). An example of this issue is his theory on sorcery and witchcraft, which he believed truly existed. Through his explanations of this theory, Ibn Khaldūn used phrases which demonstrated his inductive reasoning. For instance: "There was much sorcery among the inhabitants of Babel, that is, the Nabataean and Syrian Chaldeans," "Sorcery was greatly cultivated in Babel and Egypt," "The temples in Upper Egypt are remnants (of sorcery) attesting to the (cultivation of sorcery in ancient Egypt)," "**We have seen with our own eyes** (how a sorcerer) formed the picture of a person," "**We have observed remarkable things** as to the efficacy of talismans," "It is **attested by experience.**" (Ibn Khaldūn, 1979, p. 393).
- Section forty-one of chapter six also demonstrates Ibn Khaldūn's inductive reasoning when he claimed, "That is what happened to every nation that fell under the yoke of tyranny and learned through it the meaning of injustice. One may check this by **observing** any person who is not in control of his own affairs and has no authority on his side to guarantee his (safety). One will thus be able to infer (from the **observable facts**) that things are (as I have stated)." (Ibn Khaldūn, 1979, p. 425).
- He referred to the inductive method when he talked about linguistic theories, such as: '*Contemporary Arabic is an independent language different from the languages of the Mudar and the Himyar*.' The use of induction is clear in the passage, "Perhaps, if we were to concern ourselves with the present-day Arabic language and evolve its laws **inductively**, we would find other things and possibilities indicating what the vowel endings, which no longer exist, (used to) **indicate, things that exist in the (present-day language)** and that have their own peculiar rules." (Ibn Khaldūn, 1979, p. 1282) Another example of his use of the inductive method is evidenced by his intimate acquaintance with gaining the habit of the Arabic language. He believed that **this habit results from the constant practice** of Arabic speech, **from repeated listening** to it and from understanding the peculiar qualities of its word combinations. He mentioned that he came to this result with the help of induction. He says: "Such is a matter of argumentation **with the help of inductively derived rules**, whereas (correct use of the language) is something intuitive, resulting from the **constant practice** of Arabic speech until such time as (the person who practices it) comes to be like one of (the Arabs)" (Ibn Khaldūn, 1979, p. 440).

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7. Conclusion

The above explanations indicate that Ibn Khaldūn showed great interest in science and education, which is why he devoted a whole chapter of the *Muqaddimah* to his epistemological theories. However, it is clear that Ibn Khaldūn's epistemological theories, unlike early philosophers, are not only theoretical but also practical. Research indicates that Ibn Khaldūn predated contemporary scholars of education and philosophers with the formation of his educational curriculum. Several passages in the *Muqaddimah* testify to Ibn Khaldūn's fluency with the inductive method. It was his inductive reasoning that led him to develop his educational curriculum.

Due to an inductive examination of his society, Ibn Khaldūn categorized the sciences into intellectual sciences and religious sciences. He believed that each group has its scope and methodology. Furthermore, each group contains core subjects and supporting subjects.

Ibn Kahldūn's epistemological inductive method is also represented in his educational pedagogy, which he divided into primary and higher education. It is worth mentioning that Ibn Khaldūn did not choose a single place as a case study to prove his educational theories but selected multiple areas. He inductively examined many of the major Islamic cities, which were some of the greatest cities in the world during Ibn Khaldūn's era, such as Egypt, Morocco, and some African and Eastern cities. His inductive reasoning led him to develop unique theories on education, including methods of teaching, the relationship between the duration and quality of education, focusing on one specialization, and the values of using different methods and educational facilities when presenting knowledge.

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