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5. Literature Review (recent studies, both local and international)
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8. Discussion (should be supported with previous studies findings in an analytical way)
9. Conclusion (aligned with findings; written in present tense)
10. Recommendations (optional; linked to conclusions)
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Author: Professor Ketab Khan Faizi

Buildings and Palaces of the Ghaznavid Period

Abstract

The art of architecture in Afghanistan has been of interest to the inhabitants of this land from ancient times up to the present, especially to kings, amirs, sultans, and wealthy and influential figures. During the Ghaznavid period, they undertook the construction of buildings, palaces, and fortresses with particular enthusiasm.

Although the pavilions and palaces of the Ghaznavid era did not remain safe from the ups and downs of time and were destroyed during natural events or by destructive plunderers, at that time these palaces included the imperial center, the residences of courtiers and ministers, the royal treasury storage, and the living quarters of kings, princes, nobles, military officials, and soldiers. All of these buildings were constructed by the architects and painters of this ancient region. Some of these remains have survived in the form of ruins in Ghazni, and others are still buried beneath the soil. A number of them have been excavated by archaeologists and are briefly introduced below.

Keywords: Ghaznavid dynasty, Ghazni, Islamic architecture, palaces, minarets, archaeological excavations, brick

decoration, Kufic inscriptions, Lashkari Bazar, Khurasani architectural style

Introduction

Afghanistan, with its ancient historical background, has experienced many ups and downs throughout history and has witnessed great glory and magnificence. This grandeur became especially evident during the Middle Ages, and with its rich historical background, the country has been able to preserve many historical and archaeological monuments. Building construction began in the pre-Islamic period and continued throughout the Islamic eras. Unfortunately, in many regions of our country these historical monuments are now facing destruction; among them are the monuments of the Ghaznavid period.

In our ancient country, many rulers have governed. Some of them at times made Nangarhar, Balkh, Tokharistan, Bagram, Kabul, Kandahar, and Ghazni the centers of their territories, and sometimes they extended their power further and established their capitals even in neighboring countries. Among these places, the province of Ghazni was the center of the territory of the Ghaznavid dynasty. The founder of this dynasty was Alptigin. Later, Sultan Mahmud the Great rose to power in this land and carried out many conquests, and India was also considered part of his dominion. Mahmud and his successors, each in their own time, made efforts to promote science and culture. They attracted skilled craftsmen and artisans from ancient Persia (modern Iran) and from the regions beyond the Amu. In this way they manifested the art of the Ghaznavids

with universal aspects and distinguished qualities. Examples of this can be seen in the palaces of Lashkari Bazar, the Bala Hissar of Ghazni, and the magnificent minarets of Masoud III and Bahram Shah in Ghazni.

Significance of the Research

The buildings and palaces of the Ghaznavid period represent one of the most prominent artistic eras in this land. During this period, art flourished in its true form and has remained enduring. For this reason, the subject possesses particular importance and urgency. So far, comprehensive research on this topic has not been carried out, and it is necessary that further studies be conducted regarding it.

Research Objective

The objective of this study is to investigate, identify, and analyze the artistic remains of the Ghaznavid period through archaeological research and material evidence.

Research Questions

Main Question:

How are artistic values expressed in the architecture of buildings and palaces during the Ghaznavid period?

Sub-Questions

1. What were the purposes behind the construction of buildings and palaces during the Ghaznavid period?
2. Which construction material and building techniques were employed in Ghaznavid period architecture?

Literature review

the study of Ghaznavid buildings and palaces has been addressed through historical chronicles, archaeological excavation reports, and architectural-artistic analyses. Although these sources provide valuable information, the literature remains scattered and lacks a systematic and comprehensive synthesis focusing specifically on Ghaznavid palatial architecture in Afghanistan.

Historical writings are among the earliest sources for identifying Ghaznavid architectural achievements. Chroniclers such as Jarfadaqani provide detailed narrative descriptions of Sultan Mahmud's major construction projects, including mosques, madrasas, and palaces, emphasizing their magnificence and symbolic role in demonstrating political power (Jarfadaqani, 1345, p. 386). He also claims that Ghaznavid palaces reached such an architectural level that they had no equal in the world, though his descriptions are largely rhetorical and lack technical architectural details (Jarfadaqani, 1345, p. 147). Afghan historians such as Jalali contribute important contextual evidence regarding the spatial extent of royal buildings in Ghazni. Jalali, based on visible ruins and topographic observation, argues that the area around Rawza and adjacent zones once contained extensive royal buildings, military quarters, and residences for officials (Jalali, 1351, p. 188). Similarly, Ghubar highlights the importance of archaeological research in Ghazni and notes that excavations conducted during the twentieth century strengthened the

academic understanding of Ghaznavid culture and art (Ghubar, 1346, p. 34).

Alongside historical narratives, architectural studies provide significant insights into the construction techniques and artistic identity of Ghaznavid architecture. Habib discusses the engineering and structural characteristics of Ghaznavid buildings, noting the use of baked bricks, gypsum plaster, and stone foundations in major architectural projects such as the Palace of Masoud III (Habib, 1361, p. 207). Salek examines Ghaznavid architecture as part of the broader development of Islamic architecture in Afghanistan, emphasizing that decorative brickwork and Kufic inscriptions became defining elements of Ghaznavid artistic expression (Salek, 1364, p. 11). These works are important because they connect Ghaznavid monuments to the Khurasani architectural tradition and underline their role in shaping later Islamic architectural styles. Foreign and translated scholarship has also played an important role in documenting Ghaznavid monuments. Karchev provides comparative architectural discussions and refers to similar structural forms such as covered reservoirs, emphasizing that such architectural elements had parallels in other civilizations (Karchev, 1393, p. 204). Pugachenkova's work remains one of the major references for the study of Afghan artistic industries and architectural heritage, particularly regarding the significance of decorative traditions and monumental construction (Pugachenkova, 1357). Although these works provide broader theoretical frameworks, many of their

interpretations require further verification through updated archaeological evidence.

The most reliable and scientific body of literature concerning Ghaznavid architecture is based on archaeological excavations. The *Journal of Archaeology of Afghanistan* includes evidence related to the Palace of Masoud III and discusses the interpretation of the ruins based on excavations conducted by the Italian archaeological mission (Aram, 1362, p. 21). Archaeological research has confirmed that important Ghaznavid structures remained buried for centuries and were only rediscovered through modern excavations. Faizi also provides an organized summary of excavation activities around the Ghazni minarets, reporting the discovery of pottery, stone tools, metal artifacts, and architectural remains that support the existence of major palace complexes in the Pay-e Minar region (Faizi, 1396, pp. 22–23). In addition, official excavation reports confirm that recent excavations uncovered rooms, corridors, gypsum-covered walls, decorative brick fragments, and Kufic inscription pieces, showing that Ghaznavid architecture was not only monumental but also richly ornamented (Report of Archaeological Excavations, 1390, pp. 1–4).

Studies on Ghaznavid monuments also include geographical and descriptive works. Azimi provides detailed descriptions of the Minaret of Bahram Shah and discusses its original height and internal spiral staircase, which supports the view that Ghaznavid minarets were highly advanced in structural design (Azimi, 1391, pp. 430–431). Khalili's almanac also contributes historical descriptions related to the mosque of Arous al-Falak and emphasizes the need for further research to confirm the

identity of surviving mosque remains in Ghazni (Khalili, 1392, pp. 28–29). Hotak addresses the historical significance of Bala Hissar and describes its defensive system, gates, and later historical events such as the British invasion, which helps explain the continuity of Ghazni's strategic importance even after the Ghaznavid period (Hotak, 1395, pp. 86–87).

Overall, the literature demonstrates that Ghaznavid architecture represents one of the most significant periods of Islamic art and construction in Afghanistan. Existing studies highlight the importance of Ghazni as a political and cultural center and confirm the presence of palaces, minarets, mosques, and fortress systems. However, many studies remain descriptive rather than analytical, and the available information is distributed across historical chronicles, excavation reports, and general architectural surveys. Therefore, further systematic and interdisciplinary research is required to analyze Ghaznavid palatial architecture in terms of urban planning, artistic symbolism, and construction technology.

Research Method

This study employs a descriptive – analytical research approach combined with field research to investigate the architectural features, artistic characteristics, and cultural significance of buildings and palaces from the Ghaznavid period.

Buildings and Palaces

Architectural construction reflects human thoughts and tangible discussions of ideas and aspirations such as beliefs and values, and it represents a recognized system of material and

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spiritual valuation. In different historical periods, it has possessed various styles and methods. In other words, architecture as a living art has always been influenced by historical and cultural transformations.

Islamic architecture was first established by the Holy Prophet of Islam, Prophet Muhammad ﷺ, in Medina. Up to the present, alongside global developments, it has passed through various stages and across the Islamic world has created beauty through different styles while also acquiring artistic dimensions. One of the most brilliant periods in Islamic architecture is the architecture of the Ghaznavid period, which, by drawing inspiration from the authentic Khurasani architectural tradition and combining it with the architecture of the Islamic West, produced unparalleled masterpieces in the architecture of the Islamic world.

After his campaigns in India, Sultan Mahmud the Great returned to his homeland as a victorious conqueror with many slaves and spoils. He decided to construct a grand congregational Masjid in the city of Ghaznin, because, according to Utbi, the old congregational Masjid had been built according to the conditions of earlier times and the modest capacity of the people. At that time Ghazna was among the cities that received little attention from the Khurasani rulers. However, when Sultan Mahmud of Ghazni emerged as a powerful ruler and emperor, he intended that the capital of his realm should reflect the grandeur and authority of his empire and attract the attention of other Islamic states. For this reason, he decided to bring artists, craftsmen, and skilled architects from various parts of the conquered territories to the center—

namely the city of Ghazni—and through the construction of palaces and buildings, enhance the beauty of his capital. According to Jarfadaqani, these structures and palaces expanded to such an extent in their architectural foundation that they had no equal in the world (Jarfadaqani, 1345: 147).

The architectural art of the Ghaznavid period was first introduced by French researchers in 1949. From the architectural remains of the period of Sultan Mahmud of Ghazni, references have been made to palaces, Masjids, caravanserais, and baths. In the province of Ghazni and other regions there exist numerous architectural remains such as shrines, tombs of sultans and amirs, palaces, minarets, and other buildings. Conducting research on each of them in this article is not possible; therefore, as examples, the most important and famous buildings and palaces of that period are examined:

1. The Covered Pool or Reservoir (Hawz-e Sarposhida / Estakhr)

According to stories and legends, a covered pool (reservoir) known as the Ferdowsi Pool existed in the city of Ghazni. From here Sultan Mahmud distributed a type of silver coin called “Manit” to the poor and needy people of other regions under his rule as assistance and support. These new silver coins replaced the old golden dinar and were produced by the goldsmiths and craftsmen of the region.

In Ferdowsi’s *Shahnameh*, such reservoirs are described as places for meetings and conversation, and similar types of

structures were also common in Rome and Italy (Karchev, 1393: 204).

2. The Masjid of Arous al-Falak

One of the famous structures of the era of Sultan Mahmud of Ghazni was the congregational Masjid known as Arous al-Falak. After Sultan Mahmud returned from India to the center of Ghazni in the year 1018 AD (409–410 AH), He ordered the construction of the largest congregational Masjid in the Ghazni, to be named Arus- al- Falak, and directed that a Madrasa and residential chambers (Hujras) for students be incorporated according to their needs. (Jarfadaqani, 1345, p.386).

The Arab historian al-Utbi describes this Masjid as follows: the Masjid had a golden mihrab decorated with lapis lazuli jewels. Marble tree trunks had been brought from India, whose surfaces were smoother than the palms of young girls and as polished as a mirror. They were adorned with golden gilding and lapis lazuli decorations in purple and rose colors, reminding a person of garden trees blossoming in spring. The Masjid also had a maqsurah which, according to one account, could accommodate 1,000 people and according to another narration more than 4,000 people. Its hall was paved with white marble, and the empty spaces of each square section were lined with gold and completed with lapis lazuli, marking the places for worshippers.

Beside this Masjid, a large madrasa was also established which had libraries and other facilities. In the outer courtyard of the Masjid many fountains of different sizes had been constructed, adding beauty to the Masjid's courtyard. However, since precise information about the architecture of this building is not

available, it is difficult to judge its architectural style accurately. Some believe that the present Jami Masjid of Awliya in the city of Ghazna is the remnant of the famous Arous al-Falak Masjid, but further research and studies are needed to confirm this matter (Khalili, 1392, pp. 28–29).

3. The Mahmudi Palace (Kushk-e-Kohan)

The Mahmudi Palace, also known as Kushk-e Kohan (the Old Pavilion), was another structure from the era of the powerful Ghaznavid ruler, Amin al-Milla Mahmud. It was located in Afghan Shal (a place in Ghazni). It was considered one of the palaces of the court of Sultan Mahmud of Ghazni and a place of leisure for the Sultan.

In the year 388 AH, after settling the matter of his brother Amir Ismail, Sultan Mahmud ascended the throne of world sovereignty in Qasr-e Firouzi. The use of the New Garden and Qasr-e Firouzi in the location of the present Rawza and its surroundings began when Kushk-e Mahmudi had lost its original splendor and Sultan Mahmud's full attention was directed toward the new building, namely Qasr-e Firouzi. Today, since no remains of this magnificent palace have survived, it is not possible to estimate what it looked like, how extensive it was, what annexes it had, or how many buildings it contained. Likewise, the geometric plan of the structure cannot be determined.

However, Ghulam Jilani Jalali, based on his observation of the ruined mound, writes:

“From the observation of the ruined mound located beyond the dome of the tomb of Sultan Yamin al-Dawla, extending from

the northwest to the southeast for a distance of about three kilometers, where traces and corners of old buildings can still be seen throughout this area, it becomes clear that this area—from the Rawza to Khwaja Abu Bakr Bulgari and from there southward to the dome known as Sakhi on the slope of the eastern mountain—contained all the royal buildings and structures, guard houses, military posts, residences of the special troops, quarters of soldiers, and the assembly places of the royal servants and the pavilions of the officers of the imperial army. These palaces, buildings, pavilions, and guard houses together formed, in the northern and southern corners of ancient Ghaznin, another beautiful city by themselves.” (Jalali, 1351, p. 188)

4. Bala Hissar of Ghazni

The old city of Ghazni, known as Bala Hissar, is located on a high hill and had gates and organized streets. This structure was connected from one gate to another. From the main streets, many secondary alleys branched out in different directions. The buildings of the old city of Ghazni were mostly two or three stories high and had numerous towers, with the distance between the towers estimated to be between 15 and 25 meters (Chinkova, 1357, pp. 82–83).

Bala Hissar of Ghazni is a silent witness to the rich history of this land. As an architectural monument built approximately 4,000 years ago, it clearly stands as a remnant of the period of rule of Mahmud and Masoud of Ghazni and therefore holds special historical significance. Even after the decline of the Ghaznavid dynasty and the transfer of the capital to Herat,

Kandahar, and Kabul, Ghazni maintained its secondary role for a long time.

In 1839, after the British invasion and the siege of Bala Hissar of Ghazni, the city of Ghazni once again gained fame throughout the world. Despite the strength and seemingly impenetrable nature of this fortress, the British managed to capture it through its wooden gates, which were vulnerable to gunpowder and artillery (Hotak, 1395, pp. 86–87).



Figure 1. General view of the Bala Hissar of Ghazni, source: Voice of America (n. d.)

The citadel or Bala Hissar of Ghazni is undoubtedly considered one of the finest examples of military fortifications in the country from an architectural perspective. The old city of Ghazni was formed around this very citadel. This fortress had three passages on the northern, western, and southwestern sides, known as Bahlul, Bazaar, and Kink. Part of this city is currently in a state of destruction, and narrow bazaars once existed there, including shops such as cloth sellers, fur coat makers, goldsmiths, and coppersmiths. Near the Bala Hissar,

residential houses made of mud bricks were constructed in two or three stories.

Around the Bala Hissar of Ghazni there are tall and magnificent towers that demonstrate the defensive position of the ancient city of Ghazni. They are also considered among the valuable heritage of the past, representing the culture and architecture of the Ghaznavid era. At present, however, they are in poor condition and require greater attention from the responsible authorities (ibid.---, p. 87).

5. The Palace of Masoud III

The Palace of MasoudIII is located in a place that dominates most areas of Ghazni and lies along an important military and commercial route. Some historians believe that the Palace of Masoudwas situated in the area of Afghan Shal (Afghan Hal). According to the explanation of Abu al-Fazl Bayhaqi, the garden of Sultan Mahmud was also located in this area. As Bayhaqi states: when Sultan Masoud, the son of Mahmud, first entered Ghazna from Balkh as a ruler, he built Qasr-e Firouzi, which possessed historical and archaeological importance, as a royal shrine in honor of his father's mausoleum.

Professor Bombaci, the Italian scholar, believes that this palace may have been constructed during the reign of Ibrahim and his son MasoudIII. He also maintains that the palace survived the destruction caused by the Ghurids but was later used and attacked by the Mongol armies. Likewise, Bombaci believes that this palace remained prosperous until the period of the Khwarazm shahs, and eventually the devastating Mongol attacks destroyed it (Aram, 1362, p.21).

The Palace of Masoud III, which had remained buried under heaps of soil for many years, was excavated by a team of Italian archaeologists during the years 1337–1958. At first, the excavation operations began at the Sanjar mound. The excavations revealed that construction materials such as stone and mud bricks made from reddish clay mixed with earthy soil had been used to strengthen the walls of the structure. Baked bricks with gypsum were used in the walls, and sometimes gypsum was also used in the latticework of rooms and in floor coverings.

Except for the monuments of the Ghaznavid period that were built with baked bricks, other structures were constructed with mud walls, rammed earth, and raw bricks. In Ghazni, stone was particularly used for the construction of foundations, while baked bricks were used in certain parts of the exterior walls of the palace. This made it possible to install decorative elements on the plaster. The architectural method of this type appears to have been such that the bricks were first plastered in order to attach decorative elements, after which the decorative components were fixed onto the plaster. In addition, baked bricks were also used directly in geometric compositions as decorative materials (Habib, 1361, p. 207).

As mentioned, the Palace of Masoud III, the Minaret of Bahram Shah, the Minaret of Dawlatabad in Balkh, and Taq-e Bost are among the famous monuments of the Ghaznavid period in Afghanistan. Structures such as the Palace of Masoud III, the mausoleum of Ibrahim, and other monuments of the Ghaznavid period are also counted among the architectural building and

they are part of the architecture of the Ghaznavids. Presenting and introducing them from the perspective of archaeological excavations is of great importance, and they are considered among the artistic achievements; however, this article does not have enough capacity to introduce all of them in detail.

It is worth mentioning that the artists of the Ghaznavid period, along with Indian and Bukhara architects, were among the earliest individuals who advanced decoration together with painting in harmony and coordination. The first four-iwan architectural design appeared during the Ghaznavid period, and examples of it can clearly be observed in the plans of the Palace of Masoud III in Ghazni and the Palace of Mahmud in Lashkargah. In general, the decorative art of the Ghaznavid period is three-dimensional and represents the development of decorative traditions seen in Balkh, Samarra, and Damascus. Kufic script forms a principal element of these decorations (Salek, 1364, p. 11).

6. The Minarets of Ghazni (Pay-e Minar)

The base of the minarets of Ghazni is located about three kilometers northeast of the present city of Ghazna. During the Ghaznavid era this place was very important, and it is believed that this area at that time was a city containing palaces, gardens, and palm groves.

In Ghazni, two magnificent minarets with extraordinary architecture from the Ghaznavid period still remain. Some researchers attribute one of these minarets to Sultan Mahmud and consider it a victory tower, believing that after returning from the conquest of India he ordered the construction of this minaret to commemorate that victory. However, most

researchers and specialists in archaeology and art believe that these minarets were not victory towers, because the inscriptions found on these structures, written in Kufic script, make no reference to such matters. On the other hand, the existing inscriptions on these minarets also reject the hypothesis that they were built by Sultan Mahmud, since the name of their patron is mentioned in the inscriptions. This hypothesis emerged due to the similarity between the titles of Sultan Mahmud and the patron of one of these minarets, namely Sultan Bahram Shah.

The Minaret of MasoudIII

The Minaret of MasoudIII had a height of 44 meters and consisted of two sections. The upper section, which was semicircular and stood on a star-shaped base, was destroyed during the earthquake of 1902, and only the lower part with a height of about 20 meters remains today. Its structure appears to have been built from baked bricks and decorated in an excellent manner with brick patterns, stucco work, and clay ornamentation. The name and titles of its patron were written in a single line on the four sides of the upper section.

These names are repeated on the lower part in Kufic script. The inscription reads:

“Bism Allah al-Rahman al-Rahim, al-Sultan al-Mu‘azzam Malik al-Islam ‘Ala’ al-Dawla wa al-Din Abu Sa‘d Masoudibn Zahir al-Milla Abu al-Muzaffar Bahram Shah, may God perpetuate his kingdom.”

This inscription is decorated with a brick-laying style in which the shadows created by the spaces between the bricks are used

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to form short phrases. In earlier times, this method was used for geometric decorations, but this is the first known example in Islamic architecture where it was used to express words. Later, this method continued in subsequent periods, often using glazed bricks whose surface and color differed from other baked bricks (Khalili, 1393: 26–27).

The date of this minaret has been associated by Galina Pugachenkova with the years 1098–1099 AD (Chinkova, 1357, p. 13).



Figure 2. General view of the Minaret of Masoud III, copied from the book Review of Archaeological Excavations in Ghazni Province, 1396.

The Minaret of Bahram Shah

Bahram Shah, the son of MasoudIII, following his father's example, also built a two-story minaret about 300 meters west of the city of Ghazna. The upper half of this minaret also collapsed as a result of an earthquake. According to the writing of Mohammad Azim Azimi, the height of this minaret was originally about 65–70 meters, but due to the earthquake its upper part fell, and only about 26 meters of it remain today. A spiral staircase (stairway) inside the structure leads upward to its top (Azimi, 1391, pp. 430–431).

This minaret, like the Minaret of MasoudIII, also has an inscription whose text reads:

“Bism Allah al-Rahman al-Rahim, al-Sultan al-Mu‘azzam Malik al-Islam Yamin al-Dawla wa Amin al-Milla Abu al-Muzaffar Bahram Shah, may God perpetuate his kingdom.”

This minaret corresponds in orientation with the Minaret of Mas‘ud, and similar inscriptions can be observed on the four sides of its upper section. The Minaret of Bahram Shah is distinguished by having larger framed panels, but in these panels the bricks form geometric shapes without inscriptions.

The cylindrical form of minarets was a common style in the architecture of Islamic Khurasan. However, the star-shaped form represents a new type in its own category. Although polygonal shapes can also be observed in the Gonbad-e Qabus in Gorgan, Iran, and in the Minaret of Termez, notable differences can be seen among them. The use of decorative panels on each side of the minaret and the use of brick

ornamentation and Kufic inscriptions in an excellent style are among their distinctive characteristics.

Similar examples can be observed in Seljuk architecture, especially in the artistic school of Isfahan. However, the use of Kufic inscriptions and brick decorations is in fact a particular distinction and characteristic of the Ghaznavid architectural school, which is unique in its kind.

The careful arrangement of brick mosaics in relief forms, the use of wooden reinforcements within the body of the structures, and decorative inscriptions extending from the base to the top of the minarets in a regular sequence are among the special features of these monuments (Khalili, 1393, pp. 27–28).

Galina Pugachenkova, the Russian scholar of Afghanistan, in her book associates the date of this minaret with the reign of Yamin al-Dawla Abu al-Muzaffar Bahram Shah (1114–1115 AD). However, by mistake some works have attributed it to Sultan Mahmud and dated it to the years 1017 or 1053 (Chinkova, 1357, p. 13).

Some researchers believe that these two minarets were not independent structures but rather part of a large congregational Masjid of which only small remains survive. It is also possible that the minarets were constructed as commemorative structures celebrating victories after numerous wars and were left as memorials by the Ghaznavid sultans for future generations (Chinkova, 1357, p. 13).



Figure 3. General view of the Minarets of MasoudIII and Bahram Shah, source: www.google.com/rfi.fr.

Archaeological Research

During the years 1957–1960, significant efforts were made to introduce and better understand the culture and art of the Ghaznavid era. In particular, the archaeological excavations of the 1960s provided documented evidence that strengthened these studies and gave them greater credibility. References to these excavations have appeared here and there, which helped create opportunities for the expansion of further research (Ghubar, 1346, p. 34). Here, brief information regarding the history of surveys and archaeological excavations of the ancient sites of Ghazni is presented:

1. The Minaret Area

Excavation work around the minarets of Ghazni began in 1957 based on a prior agreement between the then government of Afghanistan and the Italian mission headed by Professor Giuseppe Tucci, the head of Italian Orientalists, together with

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the respected Professor Ahmad Ali Kohzad, the head of the Afghan mission. After surveying the historical ruins of Ghazni, they selected two areas for excavation and research: one was the Sardar Tepe of Ghazni and the other the archaeological zone of Pay-e Minar (Kohzad, 1346, pp. 1–2).

In the year 1337 AH Shamsi (1958 AD), the Italian mission under the leadership of Professor Tucci, along with a two-member Afghan team from the General Directorate of the National Museum of Kabul, arrived in Ghazni. For the first time, excavations in the archaeological zone of Pay-e Minar were conducted under the supervision of Professor Bombaci, the project director, and his colleagues in 1337 AH Shamsi (1958 AD), and these activities continued until 1964 for approximately six years.

During this period, both the Afghan and Italian teams carried out excavations in the mentioned area each year for about three to four months and also worked on the restoration and preservation of the discovered remains. As a result, after some time of excavation at Sanjar Tepe, a number of pottery vessels and stone artifacts were discovered from several rooms. However, since the excavation evidence did not clearly indicate the presence of more remains at that mound, the findings were limited to those pottery vessels and stone artifacts, and further excavations there were discontinued (Faizi, 1396: 22–23).



Figure 4. A round bronze tray decorated with various ornaments (Ghaznavid art). Note. Photograph by Mohammad Rafiq, National Museum, 1388.



Figure 5. A pottery vessel with geometric and animal decorations (Ghaznavid art). Note. Photograph by Mohammad Rafiq, National Museum, 1388.

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During seven years of excavations in the area of the Ghazni minarets, in addition to pottery and stone artifacts, metal objects were also discovered. The total number of these items exceeded 6,500 pieces. After the division of the findings with the Italian mission, approximately fifty-three items were transferred to the Kabul Museum. Some of these objects have been placed on display, while the rest are preserved in the museum's storage depots.

At the same time as these excavations, investigations were also conducted in the ruins of the mausoleum of Sultan Ibrahim. As a result, a large building was discovered, which the Italian team named the Palace of MasoudIII. After the archaeological excavations, restoration work on the palace was also carried out (Aram, 1362, p. 21).

It is also worth mentioning that on the occasion of the year 2013, an Afghan archaeological team conducted scientific excavations around the minarets of MasoudIII and Bahram Shah. As a result of these excavations, several rooms constructed of baked bricks were discovered. On their surfaces, geometric and vegetal decorations were found. In addition to baked bricks, raw bricks were also discovered in the area, which were thicker than the baked ones.

Various rooms of different shapes and sizes, along with several corridors, were uncovered. Gypsum materials had also been used on the walls. Remains of charcoal, glazed pottery vessels of a milk-tea color, unglazed vessels with parallel lines and simple coloration, fragments of glazed pottery decorated with geometric and vegetal designs, decorative bricks, and metal nails of different sizes were found.

Likewise, on the western side of the Minaret of Masoud III, glazed fragments, gypsum materials, pieces bearing Kufic inscriptions, and brick walls decorated with geometric designs were discovered. Unfortunately, restoration work has not been carried out in the area, and there is a risk that these remains may disappear (Report, 1390, pp. 1–4).

6. Lashkari Bazar

One of the important monuments of the Ghaznavid period is Qala-e Bost, located in Lashkari Bazar. This ancient fortress in the seventh century AD served as a fortified position against the Arabs. Afghan and French archaeologists surveyed and excavated the city of Lashkari Bazar. The excavations began on 27 Hamal 1327 AH Shamsi and continued until 1330 AH Shamsi (1951 AD), lasting three years and carried out in five stages.

As a result, three groups of ruins from the Ghaznavid period were discovered in the northern, southern, and central parts of Lashkari Bazar. These included pavilions, a large palace, the royal harem, a military base, the audience hall of the Ghaznavid sultans, a maqsurah or Masjid, the congregational Masjid of Lashkargah, and wall paintings depicting scenes of battle and royal gatherings of Sultan Mahmud of Ghazni.

These scenes were illustrated in several places, along with other colorful images of approximately forty guards who served as the personal protectors of Sultan Mahmud. These images were painted on the elephant-based pillars of the royal palace of Lashkargah. Many of these paintings were in the process of deterioration, and Engineer Lober transferred a number of these

colored images to the Kabul Museum (Kohzad, 1332, pp. 25–33).



Figure 6. Brick decoration with Kufic inscriptions from the Ghaznavid period. Note. National Museum of Kabul, 2006.

Conclusion

From the discussion presented, it can be concluded that the Ghaznavid period was one of the most magnificent historical and artistic eras in Afghanistan. In terms of cultural heritage, it holds a very high position, and the royal buildings and palaces represent this historical period. These monuments exist in various provinces and regions, especially in Ghazni Province, which was the center of this great empire, and also in Helmand Province in the archaeological area of Lashkari Bazar or Lashkargah.

With the arrival of the noble religion of Islam, these regions became among the most important cultural and political

centers, and the remains of their Islamic-period monuments still exist today.

With the establishment of the sacred religion of Islam, Islamic art emerged, and the art of the Ghaznavid period represents one of the most splendid forms of Islamic art. During the reign of Sultan Mahmud and his descendants, many buildings, royal palaces, and minarets were constructed, and these works are considered among the most significant examples of architectural and decorative art of the Ghaznavid era.

Recommendations

1. It is requested from the Ministry of Information and Culture to restore and preserve the monuments and buildings of the Ghaznavid period.
2. Cultural and international organizations, especially UNESCO, are requested to allocate a specific budget for the restoration of the palaces and buildings of the Ghaznavid period.
3. It is recommended to the Ministry of Information and Culture to establish a museum dedicated to the Ghaznavid period in order to support tourism development.
4. The Academy of Sciences is requested to organize scientific conferences aimed at protecting the cultural heritage of Ghazni.

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A Study of Modern Teaching Methods in the Educational System of Afghanistan

Abstract

This study examined teaching methods in Afghanistan's educational system, focusing on how instructional practices are implemented in classroom settings in selected private schools. Although effective teaching is widely recognized as essential for improving student learning outcomes, there remains limited empirical evidence on actual classroom practices in the Afghan context.

The main objective of the study was to explore the nature of teaching methods used by teachers in selected private schools in Kabul and Jalalabad.

A qualitative research design was used to gain an in-depth understanding of classroom practices. Data were collected from four private schools through sixteen non-participant classroom observations, semi-structured interviews with twenty teachers, and document analysis. Data collection was conducted between February and April 2025. Thematic analysis was used to analyze the data following Braun and Clarke's framework.

Findings revealed that teaching practices were predominantly teacher-centered, with limited integration of interactive and

student-centered approaches. Teachers mainly relied on lecture-based instruction and student memorization. The findings also indicated that insufficient training in modern pedagogical methods and a lack of instructional resources significantly restricted the use of innovative teaching strategies. The study concludes that improving teacher professional development programs and strengthening instructional resources are necessary steps for enhancing the quality of teaching methods in Afghan schools and promoting more student-centered learning environments.

Keywords: teaching methods, Afghanistan education system, student-centered learning, teacher training, classroom practice.

Introduction

Teaching methods are a central component of educational quality because they directly shape how knowledge is transmitted, understood, and applied in classrooms. Modern educational literature emphasizes that effective learning depends not only on curriculum content but also on instructional strategies that actively engage students in the learning process (Fenstermacher, 2004).

In contemporary education theory, there has been a clear shift from teacher-centered instruction toward student-centered and constructivist approaches. These approaches emphasize critical thinking, collaboration, problem-solving, and active participation as essential elements of meaningful learning (Kramer, 2018). Within this framework, learners are no longer passive recipients of information but active participants in knowledge construction.

In Afghanistan, the education system has undergone several reform efforts aimed at improving teaching quality and aligning instructional practices with modern pedagogical standards. These reforms include curriculum revision, teacher training initiatives, and professional development programs. However, classroom practice in many schools still reflects a traditional lecture-based approach where teachers dominate instruction and student participation remains limited (Ahmadi, 2012).

Empirical studies suggest that student-centered methods such as group discussion, cooperative learning, and inquiry-based instruction contribute significantly to student engagement and academic achievement (Ganyaupfu, 2013). Despite this evidence, the implementation of such methods in Afghanistan remains inconsistent due to structural, institutional, and resource-related challenges.

Therefore, this study examines teaching methods in Afghanistan's educational system, focusing on the extent to which modern pedagogical approaches are implemented across different subject areas and the factors influencing their application in classroom practice.

Statement of the Problem

Although Afghanistan's education policies emphasize the adoption of student-centered and competency-based teaching approaches, classroom practice in many schools continues to be dominated by traditional teacher-centered instruction. This reflects a persistent disconnect between policy expectations and actual instructional behavior in classrooms.

Despite ongoing reforms in curriculum development and teacher training programs, teaching practices in many Afghan schools remain largely dependent on lecture-based delivery, memorization, and limited student engagement. As a result, students often play a passive role in the learning process, which restricts the development of critical thinking, problem-solving skills, and active participation in learning activities.

This situation is further complicated by structural and institutional challenges, including inadequate teacher preparation, limited subject specialization, insufficient instructional resources, and large class sizes. These constraints reduce teachers' ability to implement modern pedagogical approaches effectively.

In addition, most existing studies in Afghanistan have examined teaching methods either in general terms or within single subject areas. There is limited empirical evidence that compares instructional practices across different disciplines such as Islamic studies, social sciences, languages, and natural sciences within a unified analytical framework. This lack of comparative insight makes it difficult to understand how teaching methods vary across subjects and what factors influence these variations.

Therefore, the core problem addressed in this study is the persistent gap between modern pedagogical expectations and actual classroom practices in Afghanistan, along with the insufficient cross-disciplinary understanding of how teaching methods are implemented across different subject areas.

Significance of the Study

This study is significant because it provides an empirical understanding of how teaching methods are actually implemented in Afghan classrooms across different subject areas. While educational policies in Afghanistan emphasize student-centered learning, there is limited evidence on how these policies are translated into classroom practice.

The study contributes to identifying the gap between policy and practice, and it highlights the practical challenges that teachers face in applying modern instructional approaches. These insights are important for policymakers, curriculum developers, and teacher training institutions.

Furthermore, the study offers subject-specific insights by comparing instructional practices in Islamic studies, social sciences, languages, and natural sciences. This comparative perspective can support more targeted educational reforms and improve the effectiveness of teaching strategies in different disciplines.

Overall, the findings can contribute to improving teacher education programs, strengthening instructional quality, and enhancing student learning outcomes in Afghanistan's education system.

Objectives of the Study

The main objectives of this study are:

- To examine the teaching methods currently used in Afghan schools
- To assess the extent of implementation of modern teaching approaches

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- To identify differences between traditional and modern instructional practices
- To explore challenges affecting the use of modern teaching methods
- To analyze variations in teaching practices across different subject areas
- To provide recommendations for improving instructional quality

Research Questions

1. What teaching methods are currently used in Afghan schools?
2. To what extent are modern teaching methods implemented in classroom practice?
3. What challenges do teachers face in applying modern instructional approaches?
4. How do teaching methods influence student engagement and participation?
5. How do teaching practices differ across Islamic studies, social sciences, languages, and natural sciences?
6. What strategies can improve the effectiveness of teaching methods in Afghanistan?

Literature Review

Teaching methods are widely recognized as a core determinant of educational quality because they directly influence how knowledge is delivered, processed, and applied in classroom settings. Contemporary educational research emphasizes that effective instruction depends not only on curriculum content

but also on pedagogical strategies that promote active student engagement and meaningful learning (Fenstermacher, 2004).

Theoretical Perspectives on Teaching Methods: Teaching methods are generally defined as systematic instructional strategies used by teachers to facilitate learning and achieve educational objectives. Traditional educational models position the teacher as the primary source of knowledge, while students assume a passive role focused on listening and memorization. This approach emphasizes the transmission of information from teacher to learner and has historically characterized many educational systems (Qasim, 2006).

Constructivist learning theory offers a different perspective by arguing that learners actively construct knowledge through experience, interaction, and reflection. According to this view, learning is an active process in which students develop understanding by connecting new information to prior knowledge and experiences (Piaget, 1972).

Vygotsky's sociocultural theory further emphasizes the importance of social interaction in learning. The theory suggests that cognitive development is enhanced when learners engage in dialogue, collaboration, and guided activities within supportive educational environments. Learning is therefore viewed as both a cognitive and social process (Vygotsky, 1978).

Modern Teaching Methods and Active Learning: Modern pedagogical approaches increasingly emphasize active learning strategies such as group discussion, cooperative learning, inquiry-based instruction, and problem-solving activities.

These methods encourage students to participate actively in the learning process rather than passively receive information. Research indicates that student-centered instruction improves academic achievement, classroom participation, and critical thinking skills (Ganyaupfu, 2013).

Active learning also contributes to deeper understanding and long-term retention of knowledge. When students engage in discussion, analysis, and practical application of concepts, they are more likely to develop meaningful understanding and transfer learning to new situations (Kramer, 2018).

The growing emphasis on active learning reflects broader educational goals that seek to prepare students for complex social, intellectual, and professional challenges. Such approaches promote independence, collaboration, and higher-order thinking skills that are essential in contemporary education (Bonwell & Eison, 1991).

Subject-Specific Teaching Approaches: The effectiveness of teaching methods varies according to the nature and objectives of different academic subjects.

In language education, interactive communication plays a central role in developing listening, speaking, reading, and writing skills. Learner participation, contextual practice, and meaningful interaction are considered essential components of effective language acquisition and language development (Bandawaal, 1999).

In social sciences, teaching requires students to analyze, interpret, and evaluate social and historical phenomena. Instruction that relies primarily on memorization is generally inadequate for developing critical thinking and analytical skills

needed for understanding complex social issues (Ahmadi, 2012).

Science education places considerable emphasis on experimentation, observation, laboratory activities, and inquiry-based learning. Practical engagement enables students to develop scientific reasoning and problem-solving abilities while strengthening conceptual understanding of scientific principles (Rahmani, 2004).

In Islamic education, contemporary teaching approaches advocate balancing traditional methods of knowledge transmission with interactive strategies that encourage reflection, discussion, and deeper understanding of religious texts and values. Such methods support both intellectual and moral development among learners (Mustaffa & Rashid, 2019).

Challenges in Implementing Modern Teaching Methods:

Despite the recognized advantages of modern instructional approaches, their implementation in developing educational systems continues to face significant challenges.

One of the most important barriers is inadequate teacher preparation. Studies conducted in Afghanistan indicate that many teachers have limited access to continuous professional development opportunities, which restricts their ability to adopt innovative and student-centered teaching practices (Stanikzai, 2020).

Another challenge is the shortage of instructional resources, including textbooks, teaching aids, laboratory facilities, and technological tools. These limitations often compel teachers to

rely heavily on traditional lecture-based instruction rather than more interactive approaches (Rahmani, 2004).

Teacher subject mismatch also affects instructional quality. In many cases, teachers are assigned to subjects outside their area of specialization, reducing their effectiveness and limiting the use of appropriate subject-specific teaching methods (Bandawaal, 1999).

Large class sizes and limited instructional time further constrain the implementation of active learning strategies. Under such conditions, teachers often find it difficult to provide individualized support and maintain meaningful student participation throughout the learning process (Stanikzai, 2020).

Empirical Studies in Afghanistan: Research on language education in Afghanistan has emphasized the importance of learner-centered approaches and active student participation in improving language learning outcomes. These studies highlight the need for interactive classroom practices that encourage communication and engagement (Bandawaal, 1999).

Studies focusing on social sciences education have identified several instructional challenges, including excessive reliance on memorization and limited opportunities for analytical discussion. Researchers have recommended teaching methods that foster critical thinking and interpretation of social issues (Ahmadi, 2012).

Research on classroom management and teacher effectiveness has demonstrated that instructional quality is closely linked to teachers' pedagogical competence, classroom organization, and ability to engage students in meaningful learning activities (Stanikzai, 2020).

Studies of Islamic education have explored value-based instructional approaches and the role of teaching methods in strengthening students' understanding of religious concepts while promoting ethical development (Bahar, 2009).

Although these studies provide valuable insights into specific educational fields, most focus on individual subjects or general pedagogical issues. There remains limited empirical research that systematically compares teaching methods across multiple disciplines within Afghanistan's education system. This gap highlights the need for further comparative studies examining how teaching methods vary across subjects and how these differences influence educational outcomes.

Research Gap: The review of existing literature shows that although teaching methods have been widely discussed in educational theory, there is limited empirical evidence on their actual implementation across different subject areas in Afghanistan.

Most studies focus on either general teaching principles or single-subject analysis, without providing a comparative cross-disciplinary perspective. As a result, little is known about how teaching practices differ across Islamic studies, social sciences, languages, and natural sciences within the same educational context.

This gap limits a comprehensive understanding of how subject type, teacher preparation, and resource availability influence instructional practices. Therefore, there is a need for empirical research that examines teaching methods across multiple

disciplines and identifies the factors shaping their implementation in Afghan classrooms.

Methodology

Research Design: This study employed a qualitative research design to explore teaching methods in Afghanistan's educational system. A qualitative approach was selected because it enables an in-depth understanding of classroom practices, teacher experiences, and instructional behaviors within their natural educational settings (Creswell and Poth, 2018). The study was conducted in four private schools located in Kabul and Jalalabad, Afghanistan. These schools were selected based on accessibility and variation in instructional environments across subject areas, including Islamic studies, social sciences, languages, and natural sciences. This setting provided an opportunity to examine how teaching methods are implemented across diverse classroom contexts. The study focused on understanding instructional practices rather than measuring their frequency or statistical distribution.

Participants and Sampling Strategy : The participants included twenty teachers teaching Islamic studies, social sciences, languages, and natural sciences across the selected schools.

Purposive sampling was used to select information-rich participants with direct classroom teaching experience during the period of data collection. Selection criteria included subject relevance, teaching experience, and active engagement in instruction.

The sample size was guided by data saturation, meaning that participant inclusion continued until no substantially new insights emerged from additional interviews.

Data Collection Methods :Data were collected between February and April 2025 through classroom observations, semi-structured interviews, and document analysis. The use of multiple data sources enabled triangulation and strengthened the credibility of the findings.

Classroom Observations :Sixteen classroom sessions were observed without the researcher taking part in the teaching activities. The focus was placed on how teachers delivered lessons, how they interacted with students, the level of student involvement, the use of teaching aids, and how classroom behavior was managed. Detailed notes were carefully written during each observation and completed right after each session to ensure accuracy and completeness.

Semi-Structured Interviews :Semi-structured interviews were conducted with twenty teachers. The interviews explored teachers' perceptions of teaching methods, classroom experiences, challenges in implementing modern instructional approaches, and professional development needs. The flexible interview format ensured consistency across participants while allowing deeper exploration of individual perspectives.

Document Analysis :Relevant curriculum documents, teacher guides, and instructional materials were analyzed to examine official expectations regarding teaching methods. Findings from document analysis were compared with classroom

observations and interview data to identify alignment and gaps between policy and actual classroom practices.

Data Analysis Procedure : Data were analyzed using thematic analysis following Braun and Clarke (2006). The process included data familiarization, initial coding, theme development, theme review, theme definition, and interpretation.

Coding was systematically applied to interview transcripts, observation notes, and documents. Themes were developed by identifying recurring patterns related to teaching methods, student engagement, instructional strategies, and implementation challenges. Convergence and divergence across data sources were also examined.

Limitations of the Study

This study is limited to four private schools in Kabul and Jalalabad; therefore, the findings cannot be generalized to all educational institutions in Afghanistan.

The sample included twenty teachers, which is appropriate for qualitative research but limits broader population representation.

The study focused on four subject areas and excluded other disciplines that may demonstrate different instructional practices.

Finally, the findings reflect classroom practices during February to April 2025 and may not capture subsequent changes in policy or instructional practice.

Findings

Classroom Observations: Classroom observations show that teacher-centered instruction is the dominant teaching approach across the selected schools. Teachers mainly use lectures, explanations, and textbook-based instruction. Student participation is generally limited to listening, note-taking, and responding to teacher questions.

Observations also show that student-centered strategies such as group work, questioning, and classroom discussion are used occasionally. However, these practices are not consistent and vary depending on the subject and available resources. Language and science classes show relatively higher levels of interaction compared to other subjects.

Semi-Structured Interviews: Interviews with teachers show that most educators rely on traditional teaching methods due to limited training in modern pedagogical approaches. Teachers report insufficient professional development opportunities as a major constraint in adopting student-centered strategies.

Participants also identify lack of instructional materials, large class sizes, and subject mismatch as key barriers to effective teaching. These factors reduce teachers' ability to apply interactive and activity-based instructional methods in classrooms.

Document Analysis: Document analysis shows that official curriculum guidelines promote student-centered and competency-based teaching approaches. Teaching manuals emphasize active learning, student participation, and skill development.

However, there is a clear gap between policy expectations and actual classroom practices. While documents support modern teaching methods, their implementation in schools remains limited due to structural and institutional constraints.

Discussion

The findings of this study confirm a persistent gap between educational policy and classroom practice in Afghanistan. Although curriculum documents promote student-centered learning, classroom observations and teacher interviews show that traditional teacher-centered instruction remains dominant. This aligns with Ahmadi (2012) and Stanikzai (2020), who report that instructional practices in Afghanistan are still largely lecture-based despite reform efforts.

The dominance of traditional methods can be explained through structural constraints identified in this study, including limited teacher training, lack of instructional resources, and large class sizes. These findings support Bandawaal (1999), who argues that weak institutional support systems significantly limit the adoption of modern teaching approaches in similar contexts.

The study further shows that where student-centered methods are used, student engagement improves noticeably. This supports Ganyaupfu (2013), who found that interactive teaching strategies positively influence student participation and academic performance. Similarly, Kramer (2018) emphasizes that active learning enhances critical thinking and long-term knowledge retention.

Subject-wise differences also emerge clearly. Language classes show relatively more interactive teaching practices, which is consistent with Bandawaal (1999), who highlights the communicative nature of language learning. In contrast, social sciences and Islamic studies remain more traditional and memorization-focused, reflecting Ahmadi's (2012) findings on content-heavy instruction in these disciplines.

In science education, occasional use of demonstrations reflects the importance of experiential learning as emphasized by Rahmani (2004). However, inconsistent implementation suggests that resource limitations continue to restrict practical learning opportunities.

Overall, the findings support a broader argument in the literature that pedagogical reform alone is insufficient without addressing structural and institutional constraints. As Creswell and Poth (2018) suggest, meaningful change in educational practice requires alignment between policy, teacher capacity, and classroom resources.

Conclusion

The study shows that teacher-centered instruction remains the dominant teaching approach in Afghan classrooms despite educational reforms that promote student-centered learning. Teaching practices continue to rely primarily on lectures, memorization, and limited student participation.

The findings indicate that modern teaching methods are implemented only to a limited extent. While language and natural science classes demonstrate relatively greater use of interactive and practical activities, Islamic studies and social

sciences continue to rely largely on traditional instructional approaches.

The study further reveals that teaching methods significantly influence student engagement and participation. Classrooms that incorporate discussion, questioning, and practical activities provide greater opportunities for student involvement than those relying exclusively on lectures.

Several challenges hinder the effective implementation of modern instructional approaches, including inadequate professional training, lack of subject specialization, insufficient teaching resources, and overcrowded classrooms.

Overall, the findings demonstrate a substantial gap between educational policy and classroom practice. Strengthening teacher professional development, improving instructional resources, and promoting subject-specific pedagogical training are essential for enhancing the effectiveness of teaching methods and expanding the use of student-centered learning in Afghanistan's education system.

Recommendations

Teacher Training: Targeted, practical training programs should be provided to improve teachers' ability to apply student-centered teaching methods effectively in classrooms.

Subject Allocation: Teachers should be assigned to subjects based on their academic qualifications to improve instructional quality and reduce reliance on traditional methods.

Learning Resources: Schools should be equipped with adequate instructional materials and laboratory facilities to

support interactive and practical learning, especially in science subjects.

Classroom Practice: Teachers should systematically integrate interactive strategies such as group work, questioning, and problem-solving activities to increase student engagement.

Science Education: Practical and laboratory-based instruction should be strengthened to improve conceptual understanding in science education.

Future Research: Future research should examine teaching practices using larger and more diverse samples across different provinces and include both public and private schools. Comparative and mixed-method studies are recommended to provide deeper insights into instructional effectiveness.

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The Role of Social Media in Raising Public Awareness of Climate Change in Afghanistan

Abstract

This study explores the role of social media in raising public awareness of climate change in Afghanistan. Climate change poses a serious threat to human life, ecosystems, and environmental sustainability in the country. Therefore, effective communication is essential to enhance public awareness and support adaptive responses. This research employed a mixed-methods approach, combining quantitative engagement analysis and qualitative content analysis of social media posts. Data were collected from official Facebook pages of four Afghan media organizations (TOLO News, Ariana News, Pajhwok News, and Shamshad News). A total of 60 climate-related posts published between January 1 and September 29, 2025 were analyzed. The findings indicate that social media significantly contributes to shaping public awareness of climate change in Afghanistan. Video content and posts related to floods and heavy rainfall generated the highest engagement levels. The study also reveals that while social media increases awareness, its effectiveness depends on content type, emotional framing, and credibility. The study

concludes that social media can act as an important tool for climate communication in Afghanistan, although its long-term behavioral impact requires further investigation.

Keywords: Social Media, Public Awareness, Climate change and Environmental.

1. Introduction

Climate change is one of the most critical global challenges, with its impacts disproportionately affecting fragile and conflict-affected countries such as Afghanistan. The country faces severe climate-related threats, including droughts, floods, air pollution, and declining agricultural productivity, which endanger livelihoods, food security, and public health. Despite these growing risks, public awareness and engagement with climate change in Afghanistan remain limited due to weak institutional capacity and restricted access to formal environmental education. In this context, media—especially social media—has emerged as a key source of climate information and public understanding (Schäfer, 2015; Hakimi et al., 2024).

Social media plays a dual role in climate change communication. On the positive side, it enables rapid dissemination of information, public discussion, and collective mobilization by amplifying credible voices such as scientists, journalists, and non-governmental organizations (Alawade & Obun-Andy, 2024). At the same time, social media platforms are highly vulnerable to misinformation, which can distort public perceptions, reduce trust in climate science, and discourage engagement with climate action. Studies show that

the credibility of information strongly determines whether social media exposure leads to constructive engagement or public disengagement, particularly in contexts with uneven digital literacy (Mocatta et al., 2022).

Although previous research has examined the role of media in shaping climate change awareness, empirical evidence on the specific influence of social media use, credibility, and misinformation remains limited in non-Western and highly vulnerable contexts such as Afghanistan. Drawing on Knowledge Gap Theory, which explains how unequal access to accurate information can widen or narrow public understanding (Donohue et al., 1975), this study examines how social media use and exposure to credible versus misleading information influence climate change awareness and engagement in Afghanistan. By doing so, it aims to provide evidence-based insights for improving climate communication and public engagement strategies in fragile settings.

Research Questions

1. How does social media contribute to raising public awareness of climate change issues in Afghanistan?
2. What types of climate change content (e.g., news, infographics, videos, and memes) on social media are most effective in reducing the knowledge gap among Afghan audiences?

Research Objectives

1. To explore the role of social media in promoting public awareness and understanding of climate change in Afghanistan.

Specific Objectives

2. To examine the role of social media in raising public awareness of climate change in Afghanistan.
3. To identify the types of climate change content on social media that generate the highest public engagement and awareness.
4. To assess the effectiveness of social media in reducing climate change knowledge gaps among Afghan audiences.

2. Literature review

Schafer (2015), reviews wide research on media's role in shaping climate change understanding, highlighting media as a main source of public knowledge. The study suggests enhancing focus on TV, online platforms, and non-Western regions, and expanding beyond print media and Western contexts. Recognized gaps include under-researched audience effects, media production processes, and behavioral outcomes, calling for more diverse, interdisciplinary, and effect-oriented studies.

Mocatta, Mayes, Hess, and Hartup (2022), examine the impact of local journalism on climate change in rural and regional Australia, an area significantly affected by global warming. Their research looks at how local reporters covered the School Strikes 4 Climate as a means to investigate media advocacy in smaller communities. While rural journalists typically engage in advocacy for the greater good, the authors discovered that dominant journalistic standards and highly polarized opinions regarding climate issues limited direct advocacy efforts. Consequently, many reporters employed subtle methods of

"quiet advocacy" to maneuver through these challenges while still promoting public engagement with climate change at the community level.

According to Alawade and Obun-Andy (2024), the media plays an essential role in shaping how the public perceives climate change, mainly through social and digital channels. Using secondary data from desk research, their study exposed that fresher media platforms—like social media, blogs, and online news outlets—have an important impact on public discussions and attitudes regarding climate change in Nigeria. The authors concluded that these platforms not only promote awareness but also motivate proactive actions toward climate challenges, suggesting that new media should be utilized to increase public education and engagement on climate change.

Hakimi , H., Safi, M. A. H., & Momand , I. U. R. (2024), The study highlights the pivotal role of public awareness in shaping active responses to climate change, highlighting the relationship among informed communities and environmental action. It discovers that heightened awareness fosters sustainable practices, encourages collective efforts, and empowers individuals as active participants in addressing environmental challenges. By examining Afghanistan as a case context, the research illustrates how local initiatives contribute to a more sustainable future, while also linking these findings to broader implications for global climate action. Although the study demonstrates the vital role of public awareness in advancing climate action in Afghanistan, it leaves a gap in assessing how such awareness translates into long-term

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behavioral change and policy implementation. Future research should therefore examine the effectiveness of awareness initiatives in driving sustained climate adaptation and mitigation strategies.

As indicated in the study Darwishean, Rahil, & Ehsas, (2024), this study explores climate change communication on the X platform in Afghanistan, highlighting the country's vulnerability and limited awareness strategies. Using content analysis, it indicates themes of climate impacts, funding gaps, and gendered vulnerabilities. Findings show the significant engagement potential of social media for shaping evidence-based policies and collective climate action.

However, a key gap in existing literature is the lack of empirical, engagement-based analysis of how social media content (e.g., video, text, infographic) influence public awareness in fragile states like Afghanistan. This study addresses this gap by analyzing real engagement data from Afghan media pages.

3. Theoretical Framework

This study is grounded in the Knowledge Gap Theory, developed by Tichenor, Donohue, and Olien in the 1970s. The theory suggests that as mass media information spreads, individuals with higher socioeconomic and educational status tend to acquire it faster than those with lower status, leading to a widening knowledge gap (Donohue, Tichenor, & Olien, 1975). However, when issues directly affect local communities or spark conflict, these gaps may narrow because wider

attention and interpersonal communication increase public engagement.

Applied to climate change in Afghanistan, this theory highlights how social media may raise awareness unevenly across society. While urban, educated groups with greater digital access may benefit quickly, rural and marginalized populations may lag behind. Yet, because climate change poses visible threats such as droughts and floods, the issue has the potential to stimulate broad concern that can reduce disparities in awareness.

Coker (2019) extends the concept of knowledge gaps to research contexts, emphasizing that identifying such gaps is the basis for creating new knowledge. In the communication field, this means social media can help close awareness gaps by providing platforms for widespread participation. Still, disparities in digital literacy and accessibility may prevent equal knowledge distribution.

Therefore, Knowledge Gap Theory provides a useful lens for this study, showing both the potential and limitations of social media in raising climate change awareness across different groups in Afghanistan.

4. Research Methodology

4.1 Research Design and Approach

This study employed a mixed-methods design, integrating both quantitative and qualitative approaches to get a comprehensive understanding of how social media contributes to public awareness of climate change in Afghanistan. The quantitative component measured audience engagement

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through numerical indicators such as likes, shares, and comments. The qualitative component analyzed the thematic and emotional content of social media posts and audience responses to determine how effectively social media conveys climate change information. Combining these methods allowed for both statistical measurement and interpretive insight, providing a holistic understanding of the phenomenon.

4.2 Data Sources and Sampling

Data were collected from official Facebook Pages of three major Afghan TV organizations, and one major News Agency. Tolo News, Ariana News, Pajhwok News, Shamshad News. These pages were selected because they are among the most widely followed media outlets in Afghanistan. The dataset covered posts published between January 1 and September 29, 2025, containing keywords and hashtags related to climate change, including #drought, #floods, #climateaction, #rainfall, and #climatechange.

The sampling was purposive, focusing specifically on posts addressing climate-related issues. Each post's type (news article, info graphic, video, or meme) was recorded along with its corresponding engagement metrics (likes, shares, comments).

4.3 Data Collection Procedures

The quantitative data were extracted and organized in Microsoft Excel, where engagement metrics were tabulated and analyzed to reveal audience interaction patterns. The Excel sheet contains structured columns for:

4.4 Date of posting and Coding Procedure

Media outlet name (Tolo News, Ariana News, Pajhwok News, Shamshad News)

Cover Date (from 1/ 1/ 2015 to 9/ 29/ 2025)

Each post was coded based on:

- Post type: (video, news article, infographic, image, meme)
- Topic category: (flood, drought, rainfall, general climate)
- Engagement metrics: likes, shares, comments
- Sentiment: positive, negative, neutral, mixed

Coding was conducted manually using a structured Excel sheet.

Each post was reviewed twice to reduce errors and improve consistency.

Qualitative data were drawn from post content and user comments to assess themes, tone, and public attitudes expressed toward climate change topics. This dual-level approach ensured that both numerical engagement and the underlying meanings behind user responses were captured.

4.5 Reliability and Validity

To improve reliability:

- Data entry was double-checked
- Duplicate or irrelevant posts were removed
- A consistent coding framework was applied to all posts

Validity was ensured through triangulation of quantitative engagement data and qualitative content interpretation.

4.6 Data Analysis

4.6.1 Quantitative Analysis

Descriptive statistics were generated in Microsoft Excel to summarize engagement patterns. Frequency counts and comparative analyses were performed to determine which types of posts received the highest interaction. This allowed identification of which media formats were most effective in engaging the public and disseminating climate change information.

4.6.2 Qualitative Analysis

A content analysis was conducted on post narratives and user comments. Each post was reviewed to identify recurring themes (e.g., awareness, concern, skepticism, solutions) and the tone of communication (informative, alarming, persuasive, or neutral). This analysis helped interpret the social meaning behind engagement patterns and highlighted how social media messages influence audience perception and understanding of climate change.

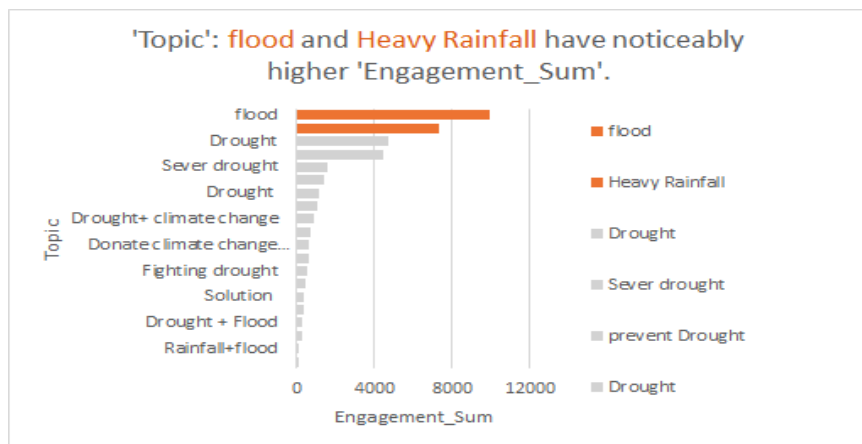
4.6.3 Ethical Considerations

Only publicly available social media data were used, ensuring that no private or personal information was accessed or disclosed. Media page names were identified as institutional sources, and individual user identities were anonymized in analysis and reporting.

5. Findings

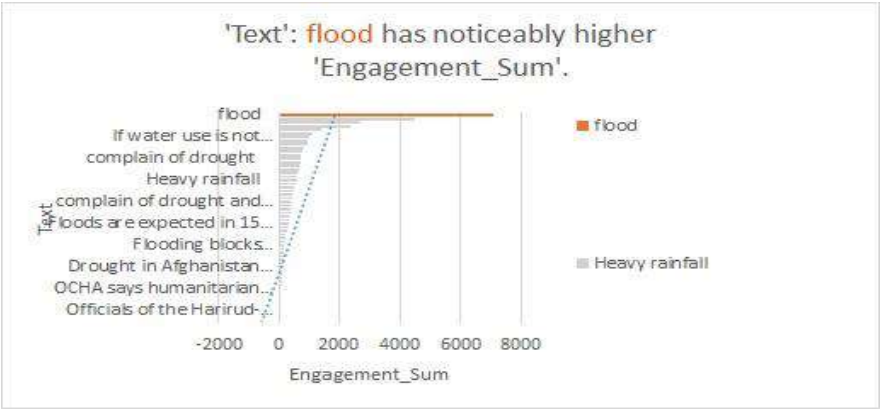
The findings demonstrate how social media raise public awareness about climate change in Afghanistan and shows the level and nature of public engagement with this issue.

Figure 1: Flood and heavy rainfall

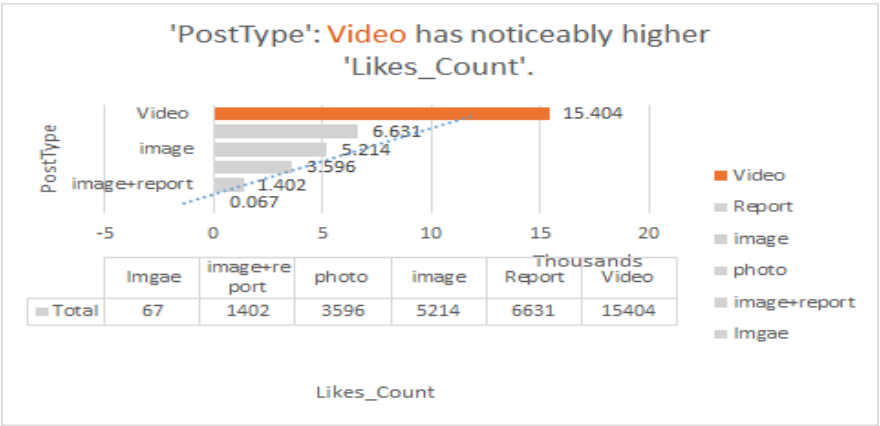


The analysis of engagement shows that content focused on floods and heavy rainfall generated the highest levels of interaction on social media, with the bar chart indicating that these topics attracted substantially more attention than any other climate-related themes in the dataset. General drought and severe drought also received engagement, but at considerably lower levels compared with flood-related posts. Other topics, including combined hazard categories and solution-oriented content, showed relatively limited interaction. Overall, the pattern demonstrates that while floods and heavy rainfall dominate immediate public response, drought-related issues still attract meaningful engagement, reflecting that people in Afghanistan continue to face and suffer from prolonged drought conditions that impact livelihoods, resources, and daily life.

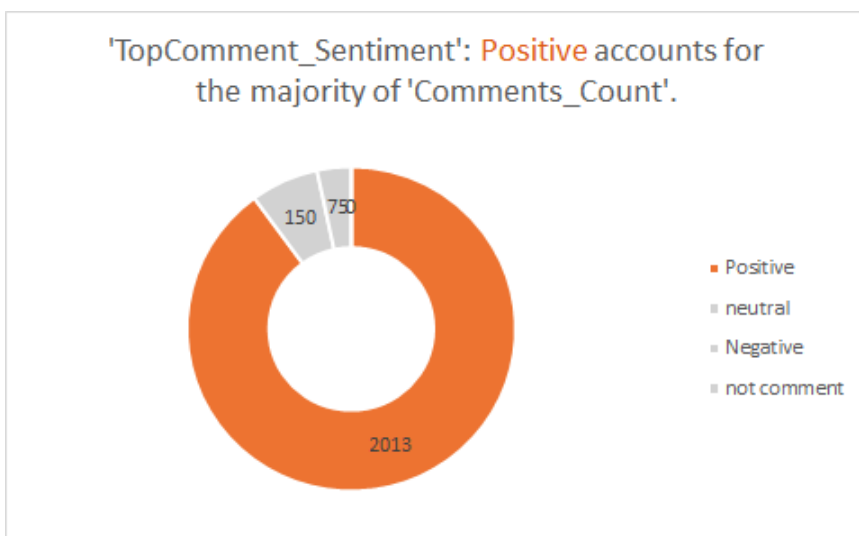
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According to the figure, posts with the word "flood" garnered the most engagement overall, far outperforming all other text categories. Although they got moderate response, a number of other phrases, such as references to heavy rainfall and complaints of drought, were still significantly less popular than those about floods. The majority of the remaining text items exhibit minimal levels of audience response. Overall, the distribution indicates that flood-related content consistently garnered the highest level of public engagement within social media content linked to climate change awareness in Afghanistan, whereas words pertaining to drought and rainfall only received minimal attention.

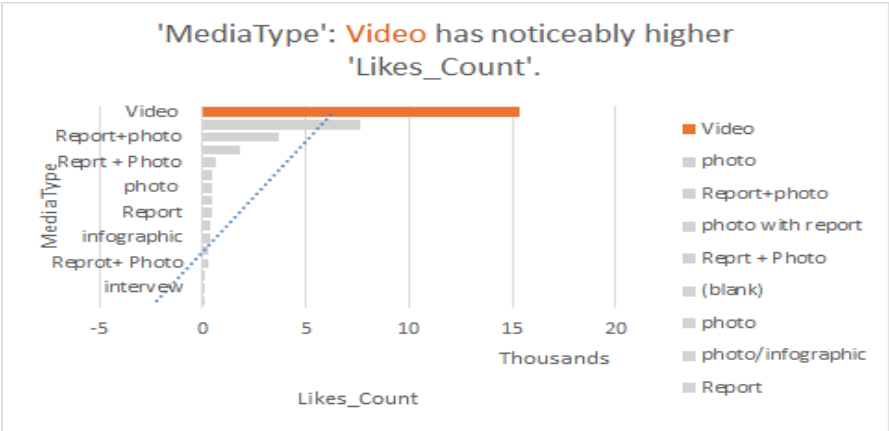


According to the figure, video posts garnered the most likes, with totals far higher than those of any other sort of post. While mixed-format posts garnered relatively little interaction, reports, pictures, and images produced moderate interest. In articles on Afghanistan that raised awareness of climate change, video content generally elicited the biggest audience response.

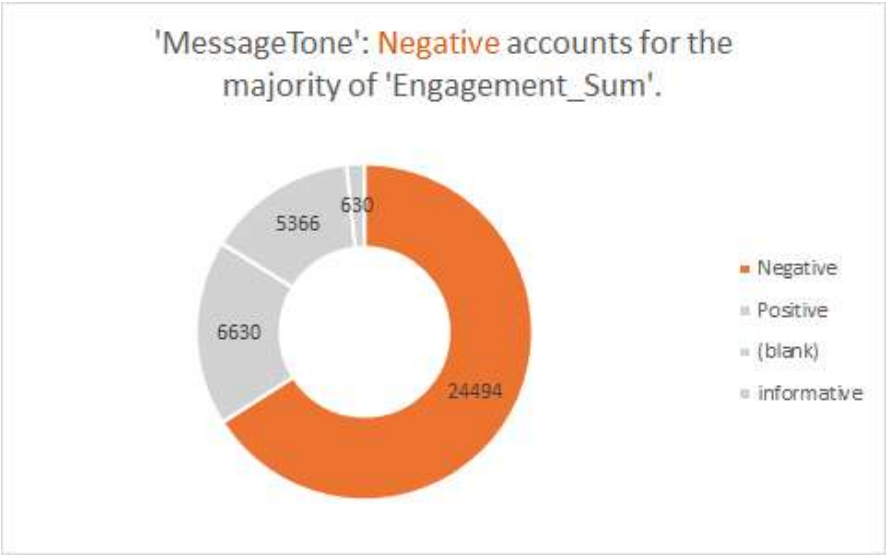


The graph shows that, with a count far greater than all other categories, positive top-comment sentiment makes up the vast majority of all comments. There are very few instances of neutral, negative, and no-comment categories. The majority of user reactions to posts about climate change in Afghanistan are generally positive.

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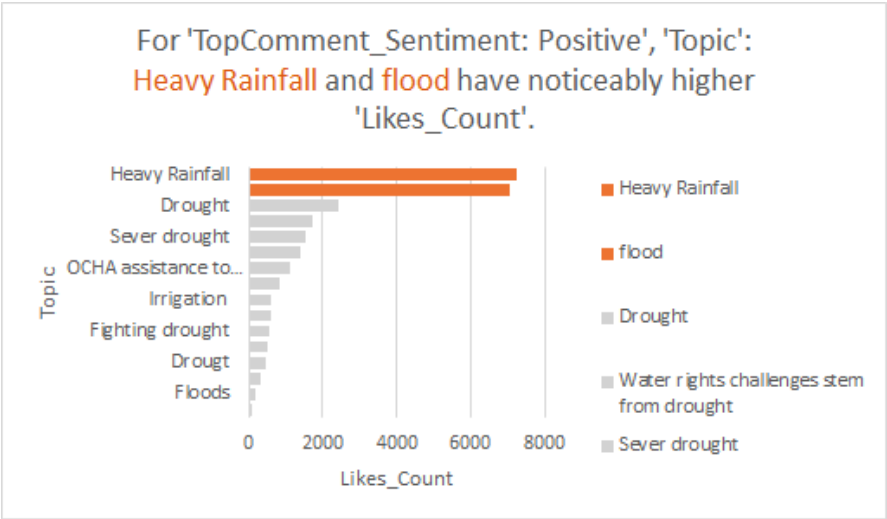


According to the figure, the most likes were given to video-based media, with totals far higher than those of any other kind of media. Info graphics and interviews demonstrated little involvement, whereas photos, reports, and hybrid formats produced modest interest. When it came to Afghanistan's posts raising awareness of climate change, video content generally generated the biggest audience response.



According to the figure, posts with a negative message tone accounted for the largest proportion of all interactions and

produced the highest overall engagement. Much lesser amounts were supplied by positive, educational, and ambiguous tones. In Afghanistan, posts with a negative tone about climate change generally garnered significantly higher audience interaction than other message types.



The analysis indicates that posts related to heavy rainfall and flood received the highest number of likes, reflecting strong audience engagement with extreme weather events. Following these topics, users frequently commented on drought, showing that after floods and heavy rains, people express concern about resulting water shortages and prolonged drought impacts.

6. Discussion

The findings of this study demonstrate that social media plays a significant role in shaping public awareness of climate change in Afghanistan, particularly through high-engagement content related to floods, heavy rainfall, and video-based messaging. To understand the broader implications of these results, it is essential to relate them to the key themes emerging from the

literature review and the research questions that guided this study.

6.1 Integration of Literature Review with Study Findings

Media as a primary source of climate knowledge

Schafer (2015) emphasizes that media serve as a crucial source of public knowledge about climate change and strongly shape how people understand the issue. He also notes gaps in research outside Western contexts and the need to explore audience effects more deeply.

This study directly contributes to filling those gaps by examining Afghanistan—a non-Western, under-researched setting—and by focusing specifically on user engagement and audience reactions. The high interaction rates with flood-related posts confirm Schafer’s assertion that media significantly influence public attention and understanding. In this case, the Afghan public pays the closest attention to climate-related hazards that they experience most directly.

The rise of digital and social media as awareness tools

Alawade & Obun-Andy (2024) highlight that newer digital platforms, particularly social media, significantly shape climate discussions and public attitudes in developing countries. This study strongly supports their conclusion. The findings show that not only is social media widely used for climate information in Afghanistan, but certain formats—especially videos—are far more effective in capturing public attention. This indicates that digital media do more than transmit information—they shape patterns of engagement and learning.

Public awareness as a driver of climate action

Hakimi et al. (2024) explain that public awareness is essential for motivating sustainable practices and collective action, although they also note the need for more research on how awareness translates into long-term behavioral change. The highly positive comment sentiment seen in this study suggests that Afghan audiences respond constructively to climate-related content, supporting the argument that awareness can encourage concern and willingness to engage. However, like Hakimi et al., this study does not determine whether awareness leads to behavioral change—pointing to an area for future research.

Social media as a space for climate communication

Darwishean et al. (2024) find that social media in Afghanistan—specifically the X platform—has strong potential to shape public engagement, especially around themes of vulnerability and climate impact. This corresponds closely with the present study's results: posts about floods, rainfall, and drought received the highest engagement, indicating that climate vulnerability resonates deeply with Afghan users across platforms. This also reinforces the idea that social media is becoming a central arena for climate discourse in Afghanistan.

6.2 Connection to Research Questions

Link to RQ1:

RQ1: How does social media contribute to raising public awareness of climate change issues in Afghanistan?

Study finds that:

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- Social media amplifies attention to severe climate hazards (especially floods).
- Video content attracts the highest engagement, demonstrating the platform's ability to visually communicate complex issues.
- Public responses are predominantly positive, showing receptiveness to climate messaging.

Together, these findings affirm that social media meaningfully increases climate awareness by making climate impacts visible, emotional, and shareable—echoing Schafer's claim that media shape public understanding and supporting Alawade & Obun-Andy's argument that newer media foster engagement in climate discourse.

Link to RQ2:

RQ2: What types of climate change content are most effective in reducing the knowledge gap among Afghan audiences?

The results show that:

- Video-based content consistently generates the highest engagement, suggesting it may help narrow the knowledge gap by reaching broader, more diverse audiences.
- Posts focusing on floods and heavy rainfall receive the strongest attention, indicating that relevance to lived experience enhances learning.
- Negative or alarming message tones trigger higher user interaction, implying that emotionally charged content prompts greater curiosity and engagement.

These findings align with Knowledge Gap Theory: people are more likely to learn when information is salient and accessible.

Since videos communicate information more clearly across literacy levels, they may help reduce unequal awareness—supporting Coker’s argument that identifying and addressing knowledge gaps is essential to expanding public understanding. Based on the literature review and findings, this study is significant because it:

✓ Contributes evidence from a context lacking prior research
Schafer (2015) identifies non-Western media systems as understudied. This study provides much-needed data from Afghanistan’s media environment.

✓ Demonstrates that social media can function as a tool for climate education and engagement

Consistent with Alawade & Obun-Andy (2024), the results confirm that social media spreads climate information widely and shapes public perception.

✓ Shows that content type and tone matter greatly for awareness-building

The effectiveness of video content and negative-toned posts mirrors wider literature suggesting that emotional, visual, and relatable messages enhance climate communication.

✓ highlights the public’s strong emotional investment in climate hazards

High engagement with flood and rainfall posts aligns with Darwishean et al. (2024), who emphasize social media’s growing role in mobilizing concern in vulnerable countries.

✓ supports the idea that public awareness is a foundation for climate action

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Hakimi et al. (2024) argue that awareness empowers communities to act. The positive sentiment in Afghan user comments supports this potential, though long-term behavioral impacts remain unclear.

6.3 Final Summary of the Discussion

Overall, this study shows that Afghan social media users are highly responsive to climate change content—especially videos and posts about floods and heavy rainfall. These findings support and extend insights from the literature review, which stresses the crucial role of media in shaping climate understanding, the growing influence of social and digital platforms, and the importance of public awareness for climate action.

By directly linking media engagement patterns to the research questions, the study demonstrates that social media can both raise climate awareness (RQ1) and help bridge knowledge gaps through effective content formats (RQ2), especially in a vulnerable country like Afghanistan.

7. Conclusion

This study examined the role of social media in raising public awareness of climate change in Afghanistan. The findings show that social platforms, particularly through video content and posts focused on floods and heavy rainfall, generate the highest levels of engagement. These results demonstrate that social media serves as an important channel for informing the public about climate-related risks and aligns with prior research emphasizing the media's influence on climate understanding. The study also indicates that audience responses are generally

positive, suggesting that the public is receptive to climate information when it is clear, relevant, and visually accessible. Overall, the research supports the central argument that social media contributes meaningfully to climate change awareness in Afghanistan and highlights how specific content types can help reduce knowledge gaps among different audiences. The significance of these findings lies in showing that effective digital communication can strengthen public understanding in a country that is highly vulnerable to climate impacts.

While the study provides insight into media engagement patterns, it does not assess how increased awareness translates into long-term behavioral change or policy influence. Future research could explore whether highly engaging content leads to sustained climate action, examine awareness levels among rural and less digitally connected populations, or investigate how different message strategies affect learning over time. This would deepen understanding of how social media can support climate adaptation and mitigation efforts in Afghanistan.

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The Role of Artificial Intelligence in Social Media in Afghanistan

Abstract

The rapid integration of Artificial Intelligence (AI) into social media platforms has significantly transformed digital communication, user experience, and content management. This study explores the multifaceted role of AI in social media, highlighting both its opportunities and challenges. AI applications—including content personalization, sentiment analysis, automated content creation, fake news detection, targeted advertising, and user behavior prediction—have enhanced engagement, optimized information dissemination, and facilitated trend forecasting. However, these benefits are accompanied by risks such as privacy violations, algorithmic bias, misinformation propagation, and potential limitations on freedom of expression. Grounded in Agenda-Setting Theory and Technological Determinism, this research emphasizes that AI not only shapes what users see but also influences societal behavior and interaction patterns. By reviewing current literature and analyzing AI applications, the study underscores the importance of responsible AI deployment through algorithmic transparency, data protection, ethical oversight, and the integration of human intelligence with machine processing to maximize benefits while mitigating risks.

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Keywords: Artificial Intelligence, Social Media, Content Personalization, Sentiment Analysis, Fake News Detection, Algorithmic Bias, Data Privacy, Ethical AI, Technological Determinism, Agenda-Setting Theory

1. Introduction

In today's digital world, social media has become one of the primary tools for communication and information exchange. These platforms are not only spaces for social interaction and information sharing among users, but also essential tools for businesses, media organizations, and politicians. In this context, Artificial Intelligence (AI) plays a pivotal role in shaping user experiences and enhancing the performance of social media platforms (Saha, n.d.).

AI, using complex algorithms and models, has enhanced human interaction on these platforms. From recognizing user behavioral patterns to personalizing the content presented, AI enables social media to optimize user experiences and respond effectively to user needs and preferences. Furthermore, AI's capacity to analyze and interpret large volumes of data helps media organizations identify emerging trends and develop more effective content creation and distribution strategies.

However, AI in social media is not limited to enhancing user experience. It also introduces challenges and risks, including privacy concerns, security threats, and the potential for information manipulation and the spread of fake news. This study examines AI's role in social media, its positive and negative impacts, and the potential challenges, aiming to

provide a comprehensive understanding of its effects on media and society.

2. Problem Statement

With the rapid advancement of technology, social media has become an inseparable part of people's lives. Concurrently, AI has gained a crucial role in managing and shaping content on these platforms. AI can personalize content, analyze user sentiments, detect fake news, and enhance user engagement.

Despite these benefits, concerns exist, including privacy violations, algorithmic biases, and negative effects on mental health. In countries like Afghanistan, where technological awareness and legal frameworks are still developing, these challenges are particularly pronounced.

Thus, the central questions arise: Does AI in social media create more opportunities or threats? How can it be utilized responsibly and effectively?

3. Significance of the Study

As technology rapidly evolves, AI plays a vital role in transforming social media—from content optimization and enhancing user engagement to sentiment analysis, fake news detection, and personalized recommendations. Given the increasing integration of social media into daily life, a scientific examination of AI's role and impact has become essential (Faizan et al., 2023; Ezz, 2024).

Simultaneously, AI in social media introduces challenges, including privacy breaches, algorithmic bias, and the dissemination of misinformation. Understanding both the

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positive and negative consequences of these developments and identifying responsible strategies necessitates rigorous research in this field.

4. Research Objectives

The objectives of this study are:

1. To examine the impact of AI on the analysis, optimization, and dissemination of information on social media.
2. To identify opportunities and challenges related to AI use in social media.
3. To propose strategies for responsible and effective utilization of AI to mitigate negative effects on privacy and information transparency.

5. Research Questions

- How does AI affect the analysis, optimization, and dissemination of information on social media?
- What are the opportunities and challenges associated with using AI in social media?
- How can AI be employed responsibly and effectively on social media platforms?

6. Theoretical Framework and Key Concepts

6.1 Theories

This study is grounded in two fundamental theories: Agenda-Setting Theory and Technological Determinism. These frameworks help understand AI's structural and influential role in shaping social media performance, especially in societies like Afghanistan, which face challenges related to digital infrastructure, low media literacy, and limited oversight.

Agenda-Setting Theory, first introduced by McCombs and Shaw (1972), posits that media highlight certain topics to guide public attention—not telling audiences what to think, but what to think about. In modern social media, AI algorithms increasingly perform this role through content personalization, prioritization, and filtering, subtly shaping users' cognitive agendas (McCombs & Shaw, 1972; Ezz, 2024).

Technological Determinism, emphasized by Postman (1993) and McLuhan, suggests that technology is not merely a neutral tool but a structural force that transforms behaviors, lifestyles, and social structures. AI, in this view, is an autonomous agent shaping media processes. Users, often unaware of the underlying mechanisms, are exposed to algorithmic decisions that determine which content they can access (Postman, 1993; Marr, 2024).

Together, these theories provide a comprehensive framework to analyze AI's dual role: guiding public opinion through content management and serving as a technological structure that shapes behavior and social interaction.

6.2 Key Concepts

Artificial Intelligence (AI): Technology in which machines, particularly computers, perform tasks resembling human intelligence, such as learning from data, reasoning, and self-correction (Saha, n.d.; Mohamed et al., 2024).

Social media: Platforms that allow users to create, share, and exchange information (The Institution of Engineering and Technology, 2017; Appel et al., 2019). Based on Web 2.0

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technology, these platforms enable two-way interaction and feature:

- User-generated content
- Direct interaction between users
- Creation of extensive communication networks

7. Literature Review and Background

7.1 History of Artificial Intelligence

AI was first introduced in 1956 by John McCarthy and colleagues, aiming to create machines capable of human-like thinking (Smith et al., 2006). Over the decades, AI has advanced through expert systems, natural language processing (NLP), and machine learning, transforming human-technology interaction.

- **Expert Systems:** Simulate decision-making behavior of human experts using knowledge bases and inference algorithms. Applications include medical diagnostics, legal analysis, banking, and economic forecasting.
- **Natural Language Processing (NLP):** Enables machines to understand and respond to human language. Examples include Siri, Alexa, GPT, and BERT.
- **Machine Learning (ML):** Allows systems to learn from data and optimize solutions for prediction, classification, pattern recognition, and complex analysis. Deep learning enhances performance in image recognition, speech detection, and games (Ergen, 2023).

7.2 Evolution of Social Media

Social media emerged in the late 1990s and early 2000s with platforms like SixDegrees, MySpace, Facebook, and Twitter.

These platforms quickly became hubs for social interaction, information exchange, and economic and political activity (Appel et al., 2019).

7.3 AI in Social Media: Literature Review

AI applications in social media have expanded, improving user experience, personalizing content, analyzing behavior, and aiding crisis management. Key roles include sentiment analysis, fake news detection, targeted advertising, automated content creation, and user engagement optimization (Haas, 2020).

Challenges include privacy violations, algorithmic bias, and security threats (Khan, 2023). Gillespie (2018) emphasizes that while AI enhances media efficiency, it may threaten media freedom if human rights frameworks are not respected. Combining human creativity with AI is seen as the best approach for future media development (Li, 2024).

8. Methodology

This study adopts a qualitative, library-based research approach to explore the role of Artificial Intelligence (AI) in social media, with particular focus on its applications, impacts, and challenges in Afghanistan. A descriptive and analytical design was used to provide a comprehensive understanding of AI's effects on content delivery, user engagement, and societal interaction.

Data Sources and Collection

Data were collected from scholarly articles, peer-reviewed journals, books, and credible reports published between 2014

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and 2024, focusing on AI applications in social media, algorithmic bias, digital literacy, and ethical considerations. Afghan-relevant examples were included through reports by local NGOs, media analyses, and institutional publications.

Data Analysis

Collected literature was analyzed using thematic content analysis, identifying key themes such as content personalization, automated content creation, sentiment analysis, fake news detection, targeted advertising, privacy concerns, and responsible AI use. Findings were categorized according to opportunities, challenges, and strategies for responsible AI deployment.

Theoretical Integration

Analysis was guided by Agenda-Setting Theory and Technological Determinism. Agenda-Setting Theory helped explain how AI algorithms shape public attention by prioritizing content, while Technological Determinism highlighted AI's influence on user behavior, social interaction, and information consumption.

Ethical Considerations

The study ensured proper citation, source credibility, and contextual sensitivity. Special attention was given to cultural and socio-political nuances in Afghanistan to avoid misrepresentation.

Limitations

Being library-based, the study lacks primary data from Afghan social media users. Additionally, rapid technological changes may limit the long-term applicability of findings.

9. Findings and Data Analysis

9.1 Applications of AI in Social Media

Artificial Intelligence (AI) has become a central component of social media platforms, transforming how content is created, shared, and consumed. Through its advanced algorithms and machine learning models, AI enables social media platforms to understand user behavior, optimize content delivery, and enhance user engagement. Based on the literature (Rahim et al., 2024; Baishya & Sarmah, 2023), the primary applications of AI in social media include content personalization, automated content creation, sentiment analysis, fake news detection, customer service improvement, big data analysis, user behavior prediction, targeted advertising, and crisis management.

Content Personalization is one of the most visible AI applications. Platforms such as Facebook, Instagram, and TikTok leverage AI to analyze user interactions, preferences, and historical behavior to provide tailored content. This personalization improves user engagement by presenting relevant posts, videos, or advertisements. However, the reliance on algorithms can also reinforce filter bubbles, where users are exposed only to information that aligns with their existing beliefs, potentially leading to biased viewpoints and limiting exposure to diverse perspectives. In Afghanistan, where social media is increasingly influential in shaping public

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opinion, AI-driven personalization has both opportunities—such as targeting educational campaigns or public health messages to specific communities—and risks, including the amplification of polarization or misinformation within segmented networks.

Automated Content Creation is another significant application. AI-powered tools, such as ChatGPT or image-generating models like DALL-E, can produce textual, visual, or multimedia content efficiently and at scale. This enables organizations to maintain an active online presence and rapidly respond to emerging trends or crises. Nevertheless, the technology poses challenges: automated content may sometimes be misleading, lack context, or fail to reflect local cultural nuances. For Afghan media outlets or NGOs, this means that while AI can support rapid content production, human oversight remains crucial to ensure accuracy, cultural sensitivity, and reliability.

Sentiment Analysis allows platforms and organizations to understand user emotions, reactions, and opinions by analyzing comments, posts, and interactions. This provides valuable insights for shaping communication strategies or identifying societal trends. However, it also raises privacy concerns because the analysis often relies on personal data. Additionally, misinterpretation of user emotions may occur due to linguistic complexities, irony, or sarcasm, which is particularly challenging in multilingual and culturally diverse societies like Afghanistan. Effective implementation requires careful calibration to respect privacy while extracting meaningful insights.

Fake News Detection is an increasingly vital application of AI. Algorithms can identify patterns associated with misinformation and flag potentially harmful content. While this is essential for improving information integrity, the system is not foolproof. AI may produce false positives, misidentifying legitimate content as false, or miss some misleading posts, leading to incomplete coverage. In the Afghan context, where digital literacy is limited and rumors can spread quickly, AI can be a valuable tool for journalists, fact-checkers, and authorities to monitor and counter misinformation—but only when combined with human verification.

Customer Service has been transformed by AI through chatbots and automated response systems. Organizations can now provide 24/7 support, personalized assistance, and instant replies to common queries. The benefits include improved efficiency and responsiveness. However, over-reliance on AI can reduce human interaction and empathy, which may be critical in conflict-affected societies like Afghanistan, where users often require nuanced, culturally sensitive communication.

Big Data Analysis involves using AI to process vast amounts of user-generated content to detect patterns, forecast trends, and optimize engagement strategies. For instance, AI can help identify emerging topics, monitor public sentiment, or optimize the timing of content distribution. Despite its utility, big data analysis carries privacy and ethical risks, particularly when sensitive data is collected or misused. Afghan institutions

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utilizing AI for social media insights must implement strict data protection policies to prevent misuse or unintended harm.

User Behavior Prediction and Targeted Advertising are closely linked applications. AI analyzes past behaviors to predict future interactions, enabling platforms to recommend personalized content or advertisements. While this improves relevance and marketing efficiency, it also raises concerns regarding manipulation, over-targeting, and ethical considerations related to consent. For example, targeted campaigns in Afghanistan can be leveraged to raise awareness about social issues or health interventions, but they may also be exploited for political influence or to reinforce biases.

Finally, Crisis Management benefits significantly from AI. Platforms can monitor user activity to detect potential crises—such as online harassment, misinformation during elections, or security-related threats—and facilitate rapid response. However, AI cannot always detect every threat or nuance, which may result in false alerts or incomplete responses. In Afghanistan, where real-time information is critical for both security and humanitarian interventions, AI-assisted crisis monitoring offers promise but requires close human supervision to ensure accuracy and appropriateness.

9.2 Positive Impacts of AI

Artificial Intelligence has significantly enhanced the functionality and effectiveness of social media platforms. One of the primary benefits is enhanced user interaction through personalized recommendations and automated messaging. By analyzing users' past behaviors, preferences, and interactions,

AI can tailor content feeds to individual users, increasing engagement and satisfaction (Kumar & Yadav, 2024). For instance, in Afghanistan, platforms such as Facebook and WhatsApp are widely used for news dissemination, community building, and political engagement. AI algorithms can help Afghan users discover content that is most relevant to their local interests, cultural topics, or professional needs, thereby improving the efficiency of information flow.

Targeted advertising is another critical benefit. AI allows advertisers and organizations to reach specific audiences based on their interests, location, and online behavior (Yadav et al., 2024). In Afghanistan, where local businesses and NGOs often have limited marketing resources, AI-driven targeted advertising enables them to reach the right communities without excessive cost, promoting awareness campaigns, health initiatives, or educational programs more effectively.

Detection of security threats and harmful content is also facilitated by AI. Algorithms can identify suspicious accounts, spam, or harmful content, such as violent videos or hate speech (Rahim et al., 2024). This capability is particularly important in conflict-prone regions of Afghanistan, where misinformation or extremist content can escalate tensions. AI tools help authorities and platform moderators respond more quickly to emerging risks, supporting safer online environments.

AI also plays a role in privacy alerts and monitoring information bias. Algorithms can flag unusual data collection practices or detect potential breaches (Simon, 2024; Haas, 2020). In Afghanistan, where legal frameworks for digital

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privacy are still developing, these automated safeguards can provide early warnings to users about potential misuse of personal data.

Finally, AI contributes to trend and behavior prediction through big data analysis (Rahim et al., 2024). By analyzing patterns in user interactions, AI can forecast trending topics, potential crises, or shifts in public sentiment. For Afghan policymakers, media organizations, and civil society, this predictive ability can inform timely interventions, enabling proactive engagement with communities on critical issues like public health, education, and social cohesion.

9.3 Challenges and Threats of AI

Despite its benefits, AI in social media carries significant risks, particularly in countries like Afghanistan where technological infrastructure, digital literacy, and regulatory oversight are limited.

Privacy violations are among the most critical concerns. AI systems rely on large datasets to provide personalized services, often collecting sensitive personal information without users' informed consent (Simon, 2024). In Afghanistan, many users may not fully understand how their data is used, increasing vulnerability to exploitation or targeted manipulation.

Algorithmic bias is another major challenge. AI algorithms can unintentionally reproduce social, cultural, or political biases present in their training data (Haas, 2020). In Afghanistan, this could mean that content from certain ethnic groups, regions, or political affiliations might be underrepresented or unfairly

prioritized, exacerbating existing societal inequalities and tensions.

The spread of fake news remains a persistent threat. Although AI can detect misinformation, algorithms are not foolproof and may fail to identify cleverly disguised false content (Rahim et al., 2024). During critical periods—such as elections, public health crises, or conflict escalations—misinformation on Afghan social media can influence public opinion, create panic, or fuel intercommunal conflicts.

Finally, threats to freedom of expression emerge due to opaque content moderation practices. AI-driven moderation might automatically remove content without human oversight or transparency, limiting access to information or silencing critical voices (Gillespie, 2018). In Afghanistan, where media freedom is already fragile, reliance on AI without clear governance could inadvertently suppress legitimate expression and hinder informed public discourse.

9.4 Strategies for Responsible AI Use

To harness AI's benefits while mitigating its risks, several strategies should be implemented, tailored to Afghanistan's specific socio-technical context:

1. Algorithmic Transparency: AI systems must be explainable, allowing users to understand why specific content is prioritized or flagged. In Afghanistan, social media users often distrust opaque technologies. Transparency initiatives can build trust and prevent misconceptions about AI's role in content filtering.

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2. Data Protection: Robust privacy policies, secure storage, and consent-based data collection are essential. Given the limited regulatory environment in Afghanistan, international best practices should guide AI deployment to protect user data from misuse.

3. Education and Awareness: AI literacy programs can inform users about how algorithms operate, their data rights, and strategies to identify misinformation. For Afghan communities, particularly in rural areas, such education is crucial to reduce vulnerability to manipulation.

4. Human–AI Collaboration: Combining human judgment with AI automation can enhance decision-making. For example, human moderators can review AI-flagged content to ensure cultural sensitivity and prevent unjust censorship. This hybrid approach is particularly relevant in Afghanistan, where sociopolitical and linguistic nuances are significant.

5. Legal and Ethical Oversight: Developing national AI regulations and ethical frameworks is necessary to govern data use, algorithmic decisions, and user protection. Collaboration with international organizations can help Afghanistan adopt frameworks aligned with global standards, ensuring responsible and accountable AI deployment.

By applying these strategies, Afghanistan can leverage AI to strengthen social media's positive impacts while minimizing risks, supporting a more informed, secure, and inclusive digital environment.

9.4 Strategies for Responsible AI Use

- **Algorithmic Transparency:** Explainable AI for user understanding.

- **Data Protection:** Strict privacy policies and secure storage.
- **Education and Awareness:** Inform users about AI and data analytics.
- **Human–AI Collaboration:** Combine AI’s computational power with human judgment (Li, 2024).
- **Legal and Ethical Oversight:** National and international AI regulations and ethical frameworks.

10. Discussion

The findings of this study demonstrate that Artificial Intelligence has a dual role in social media, acting both as an enabler of innovation and a source of potential risk. On the positive side, AI’s capabilities in content personalization, automated content creation, sentiment analysis, trend prediction, and targeted advertising have significantly enhanced user engagement and the efficiency of information dissemination (Rahim et al., 2024; Faizan et al., 2023; Kumar & Yadav, 2024). Social media platforms now have the capacity to anticipate user needs and provide highly relevant content, ultimately improving user satisfaction and retention.

In the Afghan context, these benefits have particular significance. Social media platforms such as Facebook, Instagram, Twitter, and WhatsApp play a central role in information access, civic engagement, and community building. AI-driven trend and behavior prediction can enable local media organizations, NGOs, and government bodies to identify emerging social issues or public needs proactively. For example, predictive analysis of posts related to health, education, or local conflicts can allow for timely interventions

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and targeted awareness campaigns. Similarly, AI-powered content personalization ensures that culturally and linguistically relevant material reaches diverse Afghan communities, improving the inclusivity and effectiveness of digital communication.

However, alongside these opportunities, AI introduces considerable challenges and threats. Privacy violations, due to extensive data collection, pose significant risks in Afghanistan, where legal protections for digital rights are still developing (Simon, 2024). Users often share personal and sensitive information without awareness of how it might be used, making them vulnerable to exploitation or political manipulation. Algorithmic bias is another pressing concern. AI systems trained on biased datasets can unintentionally favor certain regions, languages, or political narratives over others (Haas, 2020). In Afghanistan, with its diverse ethnic, linguistic, and political landscape, such biases could exacerbate existing inequalities or misrepresent minority perspectives.

The spread of fake news remains a persistent issue. Despite AI algorithms' capacity to detect misinformation, false narratives continue to circulate, especially during sensitive periods such as elections, public health crises, or periods of heightened conflict (Rahim et al., 2024). Misinformation can influence public opinion, incite social unrest, and undermine trust in media and institutions. Additionally, freedom of expression may be inadvertently constrained if AI-driven content moderation operates without transparency or human oversight, potentially limiting access to critical information (Gillespie, 2018).

The application of Agenda-Setting Theory and Technological Determinism provides valuable insights into these dynamics. AI algorithms serve as modern gatekeepers, subtly guiding which topics and narratives gain prominence on social media (McCombs & Shaw, 1972). Technological Determinism highlights that AI is not neutral; it shapes user behavior, social interactions, and information consumption patterns (Postman, 1993; Marr, 2024). In Afghanistan, where digital literacy varies widely, users often lack the tools to critically assess algorithm-driven content, making them particularly susceptible to these influences.

To harness AI's potential while mitigating risks, a multi-faceted strategy is necessary. Algorithmic transparency fosters user trust and ensures accountability. Data protection protocols safeguard sensitive information, and education initiatives empower users to navigate AI-driven platforms responsibly. Combining human oversight with AI capabilities ensures culturally sensitive moderation and informed decision-making, particularly in Afghanistan's complex sociopolitical landscape. Finally, legal and ethical oversight, both nationally and in collaboration with international frameworks, is essential to prevent misuse and ensure ethical AI deployment (Li, 2024).

In summary, AI in Afghan social media represents a double-edged sword. It can transform communication, improve engagement, and support social development, but it also presents risks to privacy, equity, information accuracy, and freedom of expression. Only through responsible implementation, robust governance, and human-AI

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collaboration can the benefits of AI be fully realized while minimizing potential harms.

11. Conclusion

Artificial Intelligence is a transformative force in social media, offering unprecedented opportunities for personalization, engagement, and data-driven decision-making. In Afghanistan, AI enables users to access culturally and linguistically relevant content, helps organizations and NGOs reach target communities more effectively, and allows for predictive trend analysis that can inform timely interventions on social, health, and political issues.

At the same time, AI introduces challenges that cannot be ignored. Privacy risks, algorithmic bias, misinformation, and potential constraints on freedom of expression are particularly concerning in contexts where digital literacy, infrastructure, and legal protections are limited. Misuse or unregulated deployment of AI may exacerbate social inequalities, distort public discourse, or threaten user safety and autonomy.

Responsible AI use is therefore critical. This requires a combination of algorithmic transparency, data protection, user education, human–AI collaboration, and legal and ethical oversight. By applying these measures, Afghanistan can maximize the positive impact of AI in social media while mitigating its associated risks.

Ultimately, this study highlights that AI's role is neither inherently beneficial nor harmful; its outcomes depend on conscious management, ethical implementation, and informed user engagement. In Afghanistan, a country navigating

complex social, political, and technological challenges, AI holds the potential to strengthen communication, empower communities, and enhance social cohesion—if deployed responsibly and inclusively.

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Examining the Impact of In-Service Education on the Effectiveness of Scientific Institutions: A Case Study of the Directorate of Social Sciences, Afghanistan Academy of Sciences

Abstract

In-service education is considered one of the key instruments for enhancing quality and strengthening human capital in scientific and research institutions. The objective of this study is to evaluate the role of in-service education in the effectiveness of the Directorate of Social Sciences at the Afghanistan Academy of Sciences. The main research question examines the extent to which in-service education has influenced different levels of employees' reaction, learning, job behavior change, and organizational performance within the Directorate. The research method is descriptive analytical in nature, and the data were collected through semi structured interviews with 26 employees. To enhance the validity of the data, analyzing of official documents, institutional reports, and comparison of field data with library sources were also employed. Data analysis was conducted based on the four level Kirkpatrick Model (reaction, learning, behavior, results). The findings indicate that at the reaction level, employees reported moderate to relatively high satisfaction with the

education programs. At the learning level, their managerial, administrative, and practical skills were significantly strengthened. At the behavior level, most employees were able to apply their acquired knowledge in the workplace, and positive changes in work relationships and task performance were observed. At the results level, from the respondents' perspective, the education programs have largely contributed to improving organizational efficiency, enhancing the quality of administrative services, and increasing work motivation. Overall, the results of the study demonstrate that in-service education when based on accurate needs assessment, continuity, task-related content, and qualified instructors can play a significant role in strengthening the effectiveness of the country's scientific institutions.

Keywords: Education, In-service Education, Organizational Effectiveness, Human Resource Development, Kirkpatrick Model, Improvement of Administrative Performance.

Introduction

In-service education is regarded as one of the most important instruments of human resource development in scientific institutions, as it is designed to enhance employees' knowledge, skills, and attitudes and can play a decisive role in increasing efficiency, improving the quality of scientific services, and developing research and administrative capacities. In Afghanistan, scientific institutions including the Afghanistan Academy of Sciences, face challenges such as shortages of specialized skills, limited managerial capacity, constraints in modern educational methodologies, and a growing need to

align with global developments. Under such circumstances, in-service education can serve as an effective mechanism for empowering employees and improving organizational performance. Therefore, a scientific examination of the effectiveness of such education programs within the country's scientific institutions constitutes a pressing necessity.

Objective of the study: This study aims to examine the impact of in-service education on the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences in 2025.

Research question: This study seeks to answer the following question: To what extent has in-service education influenced employees' reactions, learning outcomes, behavioral changes, and organizational performance within the Directorate of Social Sciences of the Afghanistan Academy of Sciences?

Literature Review

Several studies have examined the effectiveness of in-service education and its role in improving employee performance and organizational development in Afghanistan and other contexts. Sadaqat and Mushtaq (2021), in their study on the training programs of the Civil Service Institute of Afghanistan, found that components such as needs assessment, educational materials, and the implementation mechanism of training programs functioned at a moderate level. Their findings suggest that although in-service training programs contribute to administrative capacity building, weaknesses in planning and implementation reduce their overall effectiveness.

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Similarly, Abedi and Kabiri (2024), in a study conducted at the Directorate of Education of Nimroz Province, concluded that attitudinal, cognitive, and skill-based training programs had a positive and significant impact on employee empowerment. Their research highlighted the importance of continuous professional development in strengthening employees' competencies and improving institutional performance. These findings are largely consistent with the assumptions of Human Capital Theory, which emphasizes the role of education and training in enhancing productivity and organizational effectiveness.

In another study, Karoubi and Matani (2009) reported that in-service education significantly contributed to improving employees' job performance, strengthening professional skills, and increasing job satisfaction. Their study demonstrated that effective training programs can positively influence both individual and organizational outcomes. However, the researchers also emphasized that the success of training programs depends on factors such as relevance of educational content, organizational support, and continuity of training activities.

Although previous studies have generally confirmed the positive role of in-service education in strengthening employee performance and organizational development, most of these studies have focused on administrative institutions, educational directorates, or general public organizations. Limited attention has been paid to scientific and research institutions, particularly the Afghanistan Academy of Sciences. Therefore, the present study seeks to fill this gap by specifically examining the impact

of in-service education on the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences through the analytical lens of the Kirkpatrick Model.

Research gap

Despite these studies, no direct examination has yet been conducted on the role of in-service education in enhancing the effectiveness of Afghanistan's scientific institutions, particularly the Afghanistan Academy of Sciences. This research gap underscores the importance of the present study. The innovation of the present research lies in its descriptive–analytical approach to examining the role of in-service education in promoting the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences during the year 2025. Drawing upon field data and content analysis of interviews conducted with employees, this study seeks to present a realistic depiction of the strengths and weaknesses of existing education programs and, on this basis, propose practical recommendations.

Significance of the study: The necessity of conducting this research stems from the premise that in-service education when designed and implemented on the basis of accurate needs assessment, practical content, and effective instructional methods can play a significant role in enhancing employees' administrative, research, and scientific competencies and in creating the conditions for improving the quality of scientific institutions. Conversely, the absence of systematic planning and weaknesses in the implementation of such programs may

result in scientific stagnation, reduced productivity, and deficiencies in the provision of research services.

This article first addresses the conceptualization of in-service education. It then presents, in the analysis section, the interview findings according to the four levels of the Kirkpatrick Model. Finally, based on the data analysis, recommendations are proposed to enhance the effectiveness of education programs.

Conceptual foundation

Definition of Education

Linguistically, education is a verbal noun derived from knowledge and denotes teaching, instructing, and learning (Amid, 2009, p. 112). From the perspective of David and Robbins (2009), education is a systematic experience within the learning process aimed at creating sustained changes in employees' behavior. Stewart and Brown (2009) likewise define education as a planned effort that assists employees in acquiring the attitudes, knowledge, and skills necessary for the effective performance of their job duties. According to Ahadian et al. (2000), education is a learning process through which individuals acquire rules, skills, and attitudes that lead to improved performance. Talaghani (2008) further emphasizes that education is a purposeful process designed to generate positive changes in individual behavior and capabilities, maintaining a direct connection with career development and professional growth.

Therefore, education can be defined as an organized and continuous process conducted with the objective of enhancing employees' levels of knowledge, skills, and attitudes, and it is

recognized as one of the fundamental pillars of human resource development within administrative and educational institutions.

Definition of In-Service Education

In-service education is recognized in the human resource management literature as one of the fundamental instruments of employees' professional development. John F. Mee (as cited in Abtahi, 1997) defines it as a systematic process aimed at the continuous improvement of employees' knowledge, skills, and behaviors, leading to enhanced individual well-being and organizational efficiency. Pierre and Gauthier (1989) describe in-service education as a deliberate effort to align employees' needs and interests with organizational objectives. From Goldstein's (1993) perspective, in-service education refers to the planned acquisition of skills, rules, and attitudes that result in improved job performance within the workplace. McGehee and Thayer (1961) assert that the primary objective of this type of education is to improve individuals' job-related capabilities by increasing knowledge, strengthening skills, and refining professional attitudes.

In general, in-service education refers to those educational programs implemented after individuals are employed within an organization, with the purpose of improving job performance, enhancing skills, and fostering positive work related attitudes. This type of education primarily focuses on three dimensions: the development of task related knowledge, the strengthening of practical skills within the occupational

domain, and the cultivation of desirable organizational attitudes and behaviors (Ford, 1992, p. 19).

Types of In-Service Education Based on Nature

From the perspective of their nature, in-service education programs can be classified into two principal categories: specialized education and general education (Vajargah, 2015, p.15). This classification indicates that education programs should both address specific job-related needs and strengthen employees' general competencies.

1. Specialized Education: This type of education addresses subjects that receive limited attention during pre-service education. Its primary objective is to develop specific skills and competencies that the organization requires for improved task performance or for responding to emerging changes and developments.

2. General Education: These programs are designed to promote intellectual cohesion and enhance employees' foundational skills. Courses such as foreign language education, communication skills development, and familiarity with modern management principles fall within this category. Overall, this classification demonstrates that in-service education is not confined solely to the technical dimension but also plays a significant role in shaping employees' attitudes and strengthening their organizational identity.

Types of In-Service Education Based on Duration

According to the classification proposed by the Asia-Pacific Programme of Educational Innovation for Development (APEID, 1992), in-service education can be divided, in terms

of temporal dimension, into three main categories: short-term, long-term, and combined programs.

1. Short-Term Specialized Education: These programs are typically conducted over a period ranging from several weeks to a few months and are designed to respond rapidly to employees' skill-based and performance-related needs. Their primary characteristic is a direct linkage to job responsibilities and the organization's immediate requirements.

2. Long-Term Education: These programs are generally offered in the form of academic courses or advanced-level educational programs and are prevalent in many Asian countries such as Iran, Pakistan, Korea, Bangladesh, Nepal, and Thailand. They are designed with the objective of specialized professional development and the awarding of higher academic qualifications.

3. Combined Education: This category occupies an intermediate position between the two previous types. While benefiting from structured frameworks and long-term objectives, it is implemented through continuous short-term courses. The principal aim of this approach is to establish continuity between specialized education and long-term academic programs (Vajargah, 2015, p. 11).

Types of In-Service Education Based on Purpose

According to Vajargah (2015), in-service education can be classified, based on educational objectives, into four principal categories: orientation education, refresher education, remedial education, and knowledge-enhancement education. This classification reflects the notion that each education program is

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designed in accordance with the type of need and the stage of employees' professional development.

1. Orientation Education: This type of education is conducted for newly recruited employees to familiarize them with the organization's mission, values, and regulations, and to establish the necessary alignment between individual behavior and organizational expectations.

2. Refresher Education: The aim of these programs is to remind and update employees' previously acquired knowledge and skills. Such education becomes particularly important when technological advancements or changes in organizational procedures occur.

3. Remedial Education: These programs are designed to address gaps in employees' knowledge and skills and are usually implemented for individuals who, for various reasons, did not have sufficient learning opportunities during recruitment or service. Such education holds particular significance in developing countries and in organizations where workforce recruitment is based on immediate operational needs.

4. Developmental or Advanced Education: This type of education provides employees with the latest scientific and professional advancements in their occupational field and prepares them to obtain higher qualifications and certifications. These programs play a vital role in career development and the continual updating of professional knowledge (Vajargah, 2015, p. 12).

Overall, this classification demonstrates that in-service education is not limited to the mere transmission of knowledge

but serves as a tool for continuous learning and professional empowerment within organizations.

Objectives of In-Service Education

Vajargah (2015) identifies in-service education as a strategic tool for professional development of employees and for enhancing organizational effectiveness. According to him, the key objectives of such programs can be summarized as follows:

1. Enhancing employees' knowledge, skills, and occupational competencies to improve performance in assigned tasks.
2. Aligning human resources with workplace and technological developments and preparing them to accept organizational changes.
3. Reforming professional attitudes and behaviors to strengthen commitment, responsibility, and work ethic.
4. Increasing organizational efficiency by enhancing individual and team capabilities.
5. Providing pathways for career advancement and professional skill development.
6. Addressing employees' educational or experiential deficiencies through remedial and supplementary programs.
7. Boosting motivation and job satisfaction through opportunities for professional growth (Vajargah, 2015, pp. 40–44).

Concept of Effectiveness

The term effectiveness derives from the root effect and in Persian refers to impact, efficacy, and the generation of desired outcomes. In English, its equivalent is "Effectiveness," defined

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in the Oxford English Dictionary as the ability to achieve intended results (Oxford University Press, 2005, p. 512). Linguistically, the term denotes the capacity of a phenomenon or action to produce a tangible and measurable outcome.

In management sciences, effectiveness extends beyond general influence and refers to doing the right things correctly, or, in other words, achieving key organizational objectives. According to Peter Drucker, effectiveness is the ability to choose the right goal and move purposefully toward it (Drucker, 1993, p. 54). In organizational behavior theory, effectiveness is regarded as one of the primary indicators for evaluating institutional performance. Robbins et al. assert that effectiveness reflects the degree of alignment between actual outcomes and pre-established organizational goals (Robbins, 2009, p. 112). Similarly, in Organization Theory and Design, effectiveness is defined as the extent to which an organization achieves its goals (Daft, 2010, p. 23).

Theoretical Framework

This study is grounded in Human Capital Theory, one of the most influential theories in economics, human resource development, organizational studies, and educational management. The theory was primarily developed by Theodore Schultz (1961) and later expanded by Gary Becker (1964), who argued that education, training, and skill development should be viewed as investments in human beings, similar to investments in physical capital. According to this theory, improving employees' knowledge, competencies, and

professional skills increases their productivity and contributes directly to organizational effectiveness and development.

Human Capital Theory emphasizes that employees are not merely administrative personnel but valuable organizational assets whose capacities can be strengthened through systematic education and continuous professional development. In-service education, therefore, plays a critical role in enhancing employees' scientific knowledge, managerial abilities, practical skills, and professional attitudes. As employees acquire new competencies and improve their performance, institutions are more likely to achieve higher levels of efficiency, service quality, innovation, and organizational effectiveness.

Within scientific and research institutions, the importance of human capital becomes even more significant because the effectiveness of such institutions largely depends on the expertise, intellectual capacity, and professional performance of their employees. In contexts such as Afghanistan, where scientific institutions often face challenges related to limited resources, shortages of specialized skills, and weak administrative capacities, in-service education can serve as an important mechanism for institutional strengthening and capacity building.

Based on this theoretical perspective, the present study examines the impact of in-service education on the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences. To operationalize and evaluate this impact systematically, the study employs the Kirkpatrick Four-Level Model as an analytical framework.

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This model enables the assessment of training effectiveness through four interconnected dimensions: employees' reactions to the training programs, learning outcomes, behavioral changes in the workplace, and organizational results. Thus, while Human Capital Theory provides the theoretical foundation of the study, the Kirkpatrick Model serves as the practical framework for evaluating the effectiveness of in-service education programs.

Thus, while Human Capital Theory explains why in-service training affects organizational effectiveness, the Kirkpatrick Model provides how this impact is measured across four levels. This direct extraction of the conceptual model from the theoretical framework addresses the methodological concern raised regarding the explanatory foundation of variable relationships

Organizational Effectiveness in Human Resource Development

In the domain of education and development, effectiveness indicates the extent to which education programs influence the enhancement of employees' knowledge, skills, attitudes, and behaviors relative to organizational objectives. In this context, the Kirkpatrick Four-Level Model is one of the most widely used frameworks for measuring education effectiveness. This model evaluates effectiveness across four levels: Reaction, Learning, Behavior, and Results (Kirkpatrick & Kirkpatrick, 2006, p. 89). According to this model, effectiveness does not stop at learning; its impact should also be observable in the workplace and in organizational outcomes.

Considering the objectives of this study, effectiveness is operationally defined as: The degree to which in-service education objectives are achieved and their effect on improving individual and organizational performance in the Social Sciences Directorate of the Afghanistan Academy of Sciences. This definition encompasses both the cognitive and behavioral dimensions of education and assesses its organizational outcomes.

The Kirkpatrick Model

The Kirkpatrick Four-Level Model is among the most comprehensive and practical frameworks for assessing the effectiveness of education programs. It was first introduced by Donald Kirkpatrick in his doctoral dissertation in the 1950s and later expanded by him and his son, James Kirkpatrick. This model posits that to truly understand the impact of education, it must be evaluated sequentially and complementarily across four levels: Reaction, Learning, Behavior, and Results.

Level One: Reaction: This level addresses participants' feelings toward the education. Evaluation at this stage is primarily conducted through questionnaires assessing individuals' satisfaction with the instructor's quality, education content, environment, and facilities. Although this level alone does not indicate learning or behavioral change, dissatisfaction at this stage may lead to inattention or low motivation in subsequent stages. Therefore, the reaction level serves as a foundational indicator for the effectiveness of education in later stages.

Level Two: Learning: At this stage, the assessment examines whether participants have actually acquired new knowledge.

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Learning can occur in three domains: knowledge, attitude, and skills. Measurement tools at this level include pre-tests and post-tests, practical performance assessments, and specialized interviews (Kirkpatrick & Kirkpatrick, 2006, pp. 28–29). If no increase in knowledge or positive change in attitudes and skills is observed, it indicates deficiencies in the design or implementation of the education.

Level Three: Behavior: This level evaluates whether participants have applied what they learned in the actual work environment that is, whether real change in job behavior has occurred. Achieving this level requires, in addition to successful learning, a supportive organizational environment, including managerial support, practical opportunities, motivation, and necessary resources (Kirkpatrick & Kirkpatrick, 2006, pp. 41–42).

Level Four: Results: This final level examines the direct impact of education on organizational performance. Results may include increased productivity, reduced errors, improved service quality, enhanced customer satisfaction, or increased profitability. This stage represents the most complex aspect of evaluation, as multiple factors beyond education itself can influence outcomes. Nevertheless, this level is considered the most critical for managers and policymakers in assessing the effectiveness of education investments (Kirkpatrick & Kirkpatrick, 2006, pp. 57–58).

Conceptual Framework

The conceptual framework of this study is based on the assumption that in-service education contributes significantly

to enhancing organizational effectiveness in scientific institutions. In this framework, in-service education serves as the independent variable, while organizational effectiveness constitutes the dependent variable. Drawing upon Human Capital Theory, the study assumes that systematic training programs enhance employees' knowledge, skills, and professional competencies, which in turn improve institutional performance and effectiveness.

To operationalize this relationship, the study adopts the Kirkpatrick Four-Level Model as an analytical framework for evaluating training effectiveness. According to this model, the impact of in-service education is assessed through four interrelated dimensions: Reaction, which reflects employees' satisfaction with training programs; Learning, which measures the acquisition of knowledge and skills; Behavior, which evaluates the transfer of learning to the workplace; and Results, which examine the broader organizational outcomes of training initiatives.

The framework assumes that effective in-service education positively influences employees' reactions and learning outcomes, facilitates behavioral change in the workplace, and ultimately contributes to improved organizational effectiveness. Therefore, the relationship between training and institutional performance is understood as a multidimensional process in which educational interventions generate both individual and organizational benefits.

This conceptual model therefore guides both the data collection process and the analytical structure of the present study,

ensuring a systematic and evidence-based evaluation of training effectiveness within the Directorate.

Methodology

This study is applied in nature and was conducted using a descriptive–analytical method. Data were collected through semi-structured interviews with 26 employees of the Directorate and analyzed using thematic analysis. Sampling was conducted through a census approach, and to enhance the credibility of the findings, triangulation with education documents and participant review (member checking) were employed.

Data collection procedure: In this study, data were collected through semi-structured interviews with all participants (26 individuals), whose characteristics are detailed below:

Table 1. Demographic Characteristics of Participants

Variable	Category	Frequency	Percentage
Gender	Male	26	100%
Education Level	Phd	4	15.4%
	Master's	8	30.8%
	Bachelor's	14	53.8%
Organizational Affiliation	Academic Member, Social Sciences Center	26	100%

The table illustrates the demographic characteristics of the study participants. All 26 participants were male and academic

members of the Social Sciences Center, with educational levels ranging from Bachelor's to Master's and Doctorate degrees.

Semi-structured interviews were selected to align with the research objective, which was to gain an in-depth understanding of participants' perceptions, experiences, and application of in-service education in enhancing the effectiveness of employees at the Social Sciences Directorate of the Afghanistan Academy of Sciences. Interview questions were designed based on the theoretical framework of the study and the four dimensions of the Kirkpatrick Model (Reaction, Learning, Behavior, Results) to capture both participants' subjective perspectives and observable behavioral evidence.

Data analysis: Data were analyzed in three main stages:

1. Data Transcription and Preparation: All interviews were audio-recorded (with participant consent) and then transcribed verbatim. The transcribed texts were reviewed and edited for clarity to prepare them for coding. To maintain research ethics, participant names and identifying information were removed or anonymized.

2. Coding and Theme Extraction (Thematic and Content Analysis):

- 2.1. Open Coding: Texts were read, and meaningful statements, frequently occurring phrases, and key sentences were identified and labeled with conceptual codes (e.g., satisfaction with content, need for continuity, application in job duties).

- 2.2. Axial Coding: Related codes were grouped into larger conceptual categories, forming primary and substructures (e.g.,

content quality categorized under Learning; organizational support placed under Behavior).

2.3. Propositional and Aggregative Coding: In the final stage, these categories were organized according to the four research dimensions of the Kirkpatrick Model.

3. Descriptive Qualitative Analysis and Conversion to Descriptive Statistics: To provide referable evidence for each key theme, the number of participants mentioning that theme was counted and converted to a percentage. Simple descriptive statistics (frequency and percentage) were reported to indicate theme prevalence; however, final interpretation was based on thematic analysis and qualitative evidence to avoid oversimplification.

To enhance the reliability and validity of findings, the following measures were employed:

1. Member Check: Summarized versions of the researcher's interpretations regarding key themes were sent to several participants to confirm alignment.

2. Inter-coder Consistency: A portion of the interviews (approximately 20–30%) was independently coded by a second coder to enhance reliability.

3. Data Triangulation: Interview findings were compared with internal institutional documents (reports, education plans, and other sources).

4. Audit Trail: All stages of the analysis were documented to provide verifiable records.

Regarding ethical considerations, informed consent was obtained from participants prior to conducting interviews, and all personal information was anonymized. Since sampling was

purposive and limited to employees of a specific department, the generalizability of the results to all scientific institutions in the country is limited. Nevertheless, the data provide a rich, context-based depiction of the actual situation.

Findings

The research findings are organized and analyzed according to the four levels of the Kirkpatrick Model (Reaction, Learning, Behavior, and Results).

Level One: Reaction

At this level, employees' initial reactions to in-service education are examined in terms of perceived usefulness, satisfaction, and overall learning experience.

Table 2. Overall Evaluation of Usefulness and Satisfaction with Education Programs

Evaluation Indicator	Evaluation Level	Percentage of Respondents
Usefulness of Education	Moderate	50%
	High	50%
Satisfaction with Programs	Moderate	68%
	High	31.3%

Analysis: The findings indicate that employees' perspectives on in-service education are generally positive but heterogeneous. Half of the participants rated the usefulness of education as high, while the other half rated it as moderate. Regarding satisfaction with the education environment, teaching methods, and instructor interaction, the majority of respondents reported moderate satisfaction. This implies that, although the overall structure of the courses was acceptable,

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there remains a noticeable gap in execution quality and instructional interaction relative to the desired standard.

Table 3. General Factors of Satisfaction and Dissatisfaction with Education Programs

Evaluation Dimension	General Factors	Percentage of Respondents
Satisfaction	Environmental and interactive factors (space, instructor behavior)	50%
	Content-related factors (relevance to job, instructor expertise)	25%
	Other factors	25%
Dissatisfaction	Weak course design	50%
	Weak implementation (lack of facilities)	25%
	Other factors	25%

Analysis: Employee satisfaction was primarily influenced by environmental and interactive factors. Conversely, the primary source of dissatisfaction was weak course design. Issues such as short course duration, lack of needs assessment, and insufficient alignment of content with job tasks contributed most to dissatisfaction. This pattern reflects a structural gap between the design of education programs and the actual work needs of employees.

Level Two: Learning

Table 4. Nature and Extent of Employee Learning

Learning Dimension	Main Option	Percentage
Skills Acquired	Managerial Skills	50%
	Leadership	18.7%
	Other Skills (Computer, SPSS, Supervision)	31.3%
Extent of Learning	High	68.7%
	Moderate	31.3%

Analysis: In-service education had the greatest impact on enhancing employees' managerial skills (50%). Regarding the extent of learning, the majority of participants (68.7%) reported a high increase in their capabilities. These results demonstrate that, although in-service education generally succeeded in enhancing employees' knowledge and skills, the degree of effectiveness was not uniform across all participants.

Table 5. Effective Teaching Methods in Employee Learning

Teaching Method	Percentage
Practical Exercise	56%
Theoretical Presentation	25%
Group Discussion	18.7%

Analysis: Practical exercises (56%) were identified as the most effective instructional method. This indicates that employees prefer experiential and application based learning over other methods. Overall, these findings underscore the necessity of designing skill oriented, interactive, and practice-based education programs.

Level Three: Behavior

Table 6. Behavioral Change and Extent of Learning Transfer to the Workplace

Behavioral Dimension	Reported Status	Percentage of Respondents
Performance Change	Improved Performance	56%
	Greater Mastery	18.7%
	No Noticeable Change	25%
Transfer of Learning	Full Application	75%
	Partial Application	6.2%
	No Application	18.7%

Analysis: A substantial portion of employees (74.7% combined) experienced positive changes in work behavior. Additionally, 75% of participants reported that they were able to fully apply their newly acquired knowledge and skills in the work environment. However, the report of no noticeable behavioral change by one-quarter of respondents indicates that the transfer of learning to workplace behavior was not uniformly realized.

Table 7. Organizational Barriers and Conditions Affecting Behavior Transfer

Organizational Status	Type of Barrier or Condition	Percentage of Respondents
Transfer Conditions	Reported No Barrier	56.2%

Organizational Barrier	Lack of Meritocracy	25%
	Absence of Supportive Policies	18.7%

Analysis: More than half of the employees did not encounter significant barriers in applying their newly acquired skills. However, two key structural obstacles remain: the lack of meritocracy and the absence of supportive policies and structures. These factors can reduce employees' motivation to adopt new behaviors and may limit the effectiveness of in-service education.

Level Four: Results

Table 8. Participants' Assessment of Education Impact on Organizational Effectiveness

Level of Impact	Percentage of Respondents
High	56.2%
Moderate	25%
Low	18.7%

Analysis: The majority of participants (56.2%) considered the in-service education to have a high impact on organizational effectiveness. In contrast, 18.7% of respondents rated the impact of education as low. This group may have encountered issues where the education did not align with their actual job needs, or the work environment was insufficiently supportive. Overall, these findings indicate that the effectiveness of education on organizational performance is realized only when three key elements are simultaneously present: precise needs assessment, purposefully designed content, and organizational support for learning transfer.

Discussion

The findings of this study demonstrate that in-service education plays a significant role in enhancing the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences. Consistent with Human Capital Theory, the results indicate that investment in employees' knowledge and skills contributes to improved individual performance and organizational outcomes.

At the reaction level, participants generally expressed moderate to high satisfaction with training programs. However, concerns regarding short course duration, inadequate needs assessment, and limited educational facilities suggest that the quality of training delivery remains uneven. Similar findings have been reported in previous studies, which emphasize that employees' satisfaction with training environments and content significantly influences subsequent learning outcomes.

Regarding learning, the findings revealed noticeable improvements in managerial, leadership, and job-related skills among employees. This result supports the argument that well-designed in-service education facilitates knowledge acquisition and professional development. The prominence of practical exercises as an effective instructional method further highlights the importance of experiential learning approaches in adult education.

At the behavioral level, most participants reported applying newly acquired skills in their workplace. Nevertheless, the existence of organizational barriers, particularly the lack of meritocracy and supportive policies, indicates that learning transfer is influenced not only by training quality but also by

organizational context. This observation is consistent with the Kirkpatrick Model, which emphasizes that behavioral change requires supportive institutional conditions.

Finally, at the results level, participants perceived in-service education as contributing to greater productivity, improved service quality, and enhanced organizational coordination. However, the persistence of challenges such as insufficient continuity of training programs, limited infrastructure, and inadequate specialized instructors suggests that the effectiveness of training remains partial rather than comprehensive. Therefore, maximizing the benefits of in-service education requires systematic needs assessment, continuous program implementation, and stronger institutional support mechanism.

Conclusion

This study examined the impact of in-service education on the effectiveness of the Directorate of Social Sciences of the Afghanistan Academy of Sciences using the Kirkpatrick Four-Level Model as an analytical framework. The findings indicate that in-service education positively influences employees' satisfaction, learning outcomes, workplace behavior, and organizational performance. Overall, the results demonstrate that training programs have contributed to enhancing professional competencies, improving administrative processes, and strengthening institutional effectiveness.

Despite these positive outcomes, the study revealed that the effectiveness of in-service education remains constrained by several factors, including inadequate needs assessment, short

training duration, limited continuity of programs, and insufficient institutional support. Therefore, while in-service education can serve as an important mechanism for organizational development and capacity building, its long-term effectiveness depends on systematic planning, continuous implementation, and supportive organizational structures.

The findings of this study contribute to the growing literature on human resource development in scientific institutions, particularly in developing contexts such as Afghanistan, and provide practical insights for policymakers and administrators seeking to improve the quality and effectiveness of training programs.

Recommendations

1. Conducting a precise and scientific needs assessment prior to designing training programs to accurately identify employees' actual job-related needs.
2. Employing active instructional methods, such as practical exercises and group work, to enhance learning and promote more effective participation.
3. Aligning course content with employees' real job responsibilities to ensure greater practical applicability.
4. Utilizing specialized instructors who are familiar with the work environment of governmental institutions to significantly improve the quality of education.
5. Providing organizational support after training as an essential condition for the successful application of learned skills in the workplace.

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