

# Smartphone Potential Energy in the Digital Era and the Construction of Learning Organizations in Universities

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**Abstract.** As human society enters the digital era in the 21st century, the widespread application of smartphones is reshaping the educational ecosystem. Smartphones not only possess communication, entertainment, and payment functions but also educational and relationship adjustment capabilities. These positive, promotive functions endowed by smartphones are referred to as smartphone potential energy. A survey conducted among students in three English teaching classes at a Beijing university revealed that smartphone potential energy typically plays four roles: resource sharer, direction guide, relationship facilitator, and learning motivator, thereby promoting the construction of university learning organization relationships. Under the influence of smartphone potential energy, organizational relationships shift from a focus on subjective interpersonal relationships to objective neutrality, and organizational structures evolve from linear hierarchical to flat structures, achieving a transition from management to governance, which provides insights for university grassroots student organization managers to scientifically implement organizational management and optimize relationships in the digital era.

**Keywords:** Smartphone Potential Energy; Learning Organization; Organizational Relationships; Digital Era.

## 1. Introduction

As a portable device that integrates communication, computation, entertainment, life, and education, smartphones profoundly influence and alter the way people live in the 21st century. They feature independent operating systems, allowing users to install software, games, and other third-party applications, and access wireless networks through mobile communication networks. The global penetration rate of smartphones continues to grow, with the International Data Corporation (IDC) reporting that the worldwide smartphone shipment volume is expected to reach hundreds of millions of units by 2023. In China, the smartphone penetration rate exceeds 90%, becoming almost a standard for college students.

Smartphones are favored due to the smartphone potential energy (SPE) they possess, which meets the needs and preferences of people in their daily life, learning, and work. Beyond basic functions such as photography, video recording, internet browsing, payment, location services, emailing, music listening, and movie watching, smartphones also facilitate real-time and instant communication, support social media, and allow for the downloading of various applications. Smartphones not only offer communication, entertainment, payment, navigation, health management, smart home, and online education functions but also play a role in building interpersonal relationships, all of which contribute positively to users' experiences. The era of smartphones has arrived, and our task is to fully leverage this potential energy to provide high-quality services for mankind.

The concept of smartphone potential energy originates from the physical concept of potential energy. Energy exists in two forms: potential and kinetic. Potential energy is the stored energy within a system, the latent energy of a stationary object that can be released or transformed into other forms of energy. There are several types of potential energy, including gravitational, elastic, molecular, electrical, and gravitational potential energy, each independent and related to the mass and position of an object. Smartphone potential energy is the energy that users possess due to their use of smartphones, representing the latent capabilities of the device. It is vast in potential, directly

related to the usage patterns and frequency of the smartphone user, and can provide high-quality services to the holder.

Smartphones are influencing and reshaping the educational ecosystem. The application of smartphones in education is primarily reflected in the following aspects: First, smartphones provide convenient learning tools, allowing students to engage in self-directed learning through mobile applications and online courses, breaking the spatial and temporal limitations of traditional classrooms. Second, smartphones facilitate the sharing of educational resources, enabling high-quality educational content to be disseminated through the internet, enhancing educational equity. Third, smartphones enhance the interaction between teachers and students in universities, with real-time communication software and online classrooms enabling teachers to understand students' learning conditions in real-time and provide personalized guidance.

Current scholarly research on the impact of smartphones on education and organizations focuses on three main areas: First, actively utilizing smartphones to innovate classroom models, as proposed by Zhu Rongping (2018) who suggested creating a new type of classroom teaching model for college English autonomous learning; [1] Tang Xinfang (2018) proposed a blended teaching method of "pre-class mobile autonomous preview, in-class teacher lecture and teacher-student interaction, post-class mobile cooperative learning." [2] Second, the negative impact of smartphones on the classroom and corresponding strategies, which manifest as "reduced student learning investment, decreased learning focus, and impaired independent thinking," [3] with suggestions for a "restriction + guidance" strategy; Guo Kaiying (2018) proposed that students' excessive reliance on smartphones and distraction should be addressed by using smartphones as educational aids. [4] Wang Yaqin (2018) believes that in the context of "Internet +," it is more effective to guide rather than block students from using smartphones during lectures, and that blended learning both in and out of the classroom is crucial for students. [5] Third, the changes in interpersonal relationships and organizational management brought about by smartphones, with scholars focusing on the construction of university dormitory interpersonal relationships in a mobile social environment (Zhang Pei, Tian Feiyan, 2019), [6] and the organizational transformation brought about by digitalization in banks (Zhang Qingjun, Du Ke, He Dexu, 2023), noting that digitalization can promote changes in employee structure and executive power dynamics. [7] Overall, these studies are centered around the functional applications of smartphones in education and practice, and there is a need to dialectically view the pros and cons of smartphones, emphasizing the adaptation to the positive impacts brought by the digital era and utilizing their characteristics for educational activities. It is encouraging to see scholars focusing on the changes in interpersonal relationships beyond the functional aspects of smartphones, but there is still a lack of research on the transformation of university grassroots organizational relationships brought about by smartphone use. These studies largely concentrate on the application methods and strategies of smartphone functions in educational teaching, with little discussion on the impact of smartphones on university student relationships and organizational relationships, which is the research perspective of this paper: What kind of impact does the smartphone have on organizational relationships? How does it influence learning organizations? Why does such an impact occur? This paper aims to address these questions through the study of an organizational relationship case in the background of two EFL(English as a foreign language) teaching classes.

## **2. Characteristics of University Learning Organizations**

University learning organizations typically exhibit four distinct characteristics, which are particularly important in the educational practice of English teaching classroom management: First is continuous learning and knowledge sharing. Learning organizations emphasize the continuous learning of individuals and collectives, as well as the accumulation and sharing of knowledge. This requires an open environment within the organization, encouraging members to constantly explore new knowledge and apply it in practice. In English teaching, this means that teachers need to

continuously update their teaching methods and language knowledge, while also encouraging students to actively explore and share during the learning process. Mobile devices allow employees the opportunity to immediately access a wide array of information. [8] The classroom can be designed as a platform for knowledge sharing, where students and teachers participate together in discussions, project collaborations, and case studies to integrate theoretical knowledge with practical language application. Second is the emphasis on systems thinking and the cultivation of innovative abilities. Learning organizations advocate for systems thinking and promotion of learning capabilities, which means viewing problems and challenges not just in isolation but from a holistic and long-term perspective, understanding the interrelationships and influences among various components. In English teaching management, this implies that teachers need to consider the interplay of multiple aspects, such as curriculum design, teaching methods, and assessment systems. For instance, the design of the assessment system should align with teaching objectives and students' learning needs to promote their comprehensive development. Learning organizations can quickly adapt to changes in the external environment and innovate based on these changes. This capability requires members to possess flexibility and creative thinking. In English teaching, teachers should be able to adjust teaching strategies flexibly according to student feedback, teaching outcomes, and developments in educational technology. For example, utilizing smartphone applications for instant feedback, interactive learning, or developing new teaching resources to enhance teaching effectiveness. Lastly is the shaping of a leadership culture. Leadership in learning organizations is not just about command and control but more importantly, inspiring and guiding members to learn together, fostering an organizational culture that promotes learning and innovation. In English teaching, teachers should act as guides and facilitators of learning, creating a positive classroom atmosphere that encourages students to ask questions, think critically, and learn autonomously. At the same time, teachers need to cultivate their own leadership skills to inspire students' enthusiasm for learning and innovative spirit.

Combining these four characteristics, English teaching classroom management should strive to create an environment that supports continuous learning, encourages systems thinking, adaptability, and innovative capabilities. Through strong leadership and a positive organizational culture, it promotes the joint growth of students and teachers. Such a classroom not only improves English teaching outcomes but also cultivates students' lifelong learning abilities.

### **3. The Impact of Smartphones on Learning Organizations**

#### **3.1 Survey Description**

To investigate the impact of smartphones on learning organizations, a survey study was conducted. The subjects of the study were 96 students from three classes in the Computer Science and Big Data majors of the 2022 cohort, all first-year students from a university in Beijing. The three classes, with 32 students each, were part of learning organizations: ordinary university classes. A questionnaire regarding the impact of smartphones on the students was distributed, with 96 copies distributed and 95 returned, one unaccounted for due to a student's illness. All 95 returned questionnaires were valid and complete.

#### **3.2 Survey Results**

The survey questionnaire encompassed ten dimensions with 20 questions, covering aspects such as learning resource acquisition, learning efficiency, interpersonal relationships, innovative abilities, critical thinking skills, learning focus, extracurricular learning, information filtering and processing, time management, and learning experience. Each dimension addressed two specific questions, with students selecting from four options: A (Very Positive), B (Positive), C (Negative), D (Very Negative). A total of 95 survey forms were received, and the statistical results are presented in Table 1.

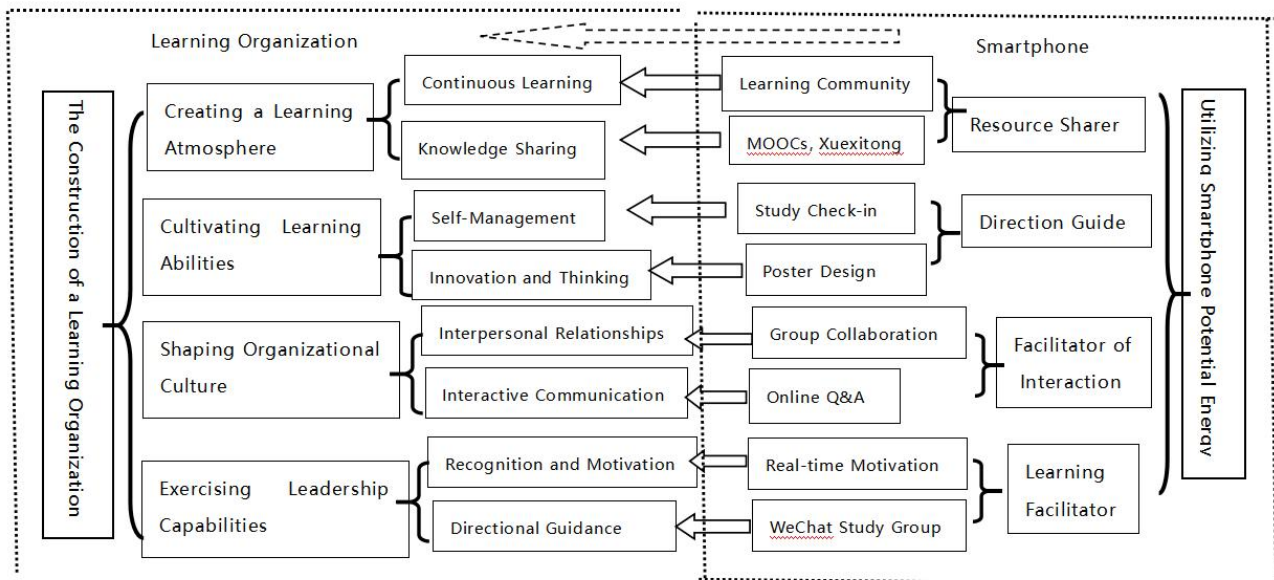
Serial No.	Main Theme	Subtheme	A. Very Positive		B. Positive		C. Negative		D. Very Negative	
1	Access to Learning Resources	Do smartphones have increased the variety of learning resources you have access to?	93	98%	2	2%				
2		Do smartphones make it easier for you to access learning resources?	95	100%						
3	Learning Efficiency	Do smartphones improve the speed at which you complete learning tasks?	95	100%						
4		Do smartphones help you more effectively organize and manage your study materials?	95	100%						
5	Interpersonal Relationships	Do smartphones facilitate communication and collaboration with classmates?	92	97%	3	3%				
6		Do smartphones contribute to the development of your social skills?	93	98%	2	2%				
7	Innovative Abilities	Do smartphones stimulate your creative thinking?	90	95%	3	3%	2	2%		
8		Do smartphones help you explore new ideas and concepts?	95	100%						
9	Critical Thinking	Do smartphones enhance your analytical skills?	85	89%	5	5%	5	5%		
10		Do smartphones improve your ability to critically evaluate information?	90	95%	4	4%	1	1%		
11	Classroom Focus	Do smartphones increase your note-taking and engagement in the classroom?	80	84%	9	9%	4	4%	2	2%
12		Do smartphones help you stay focused during lectures?	75	79%	9	9%	4	4%	7	7%
13	Extracurricular Learning	Do smartphones increase your participation in online courses and educational apps?	90	95%	5	5%				
14		Do smartphones promote your activity in virtual study groups and forums?	94	99%	1	1%				
15	Information Filtering and Processing	Do smartphones improve your ability to filter and process information?	90	95%	5	5%				
16		Do smartphones help you more accurately identify relevant information?	75	79%	12	13%	5	5%	3	3%
17	Time Management	Do smartphones help you manage your time and priorities more effectively?	80	84%	10	11%	3	3%	2	2%
18		Do smartphones lead you to procrastinate more easily?	61	64%	23	24%	7	7%	4	4%
19	Learning Experience	Has the overall experience of learning been enhanced by smartphones?	75	79%	16	17%	4	4%		
20		Does the use of smartphones have a negative impact on your academic performance?	2	2%	3	3%	10	11%	80	84%

Table 1. A Survey Questionnaire

Based on the statistical findings, the utilization of smartphones generally exerts a positive influence on the construction of learning organizations. Specifically, the role of smartphones in enhancing learning efficiency is highly recognized by students, with a unanimous agreement (100% approval). Furthermore, smartphones demonstrate exceptional performance in increasing access to learning resources, with accessibility reaching a full 100%, and variety receiving a 98% approval rating. The facilitative effect of smartphones is also evident in boosting innovative capabilities and the exploration of new knowledge, with approval rates of 95% and 100%, respectively. Additionally, the role of smartphones in fostering the improvement of interpersonal relationships is widely acknowledged, with 97% of respondents believing that smartphones can promote collaboration and communication with classmates, and 98% considering smartphones conducive to the development of social skills. Of course, the surveyed individuals also hold a relatively affirmative view on the impact of smartphones on classroom focus, with a significant 84% and 79% of individuals acknowledging the influence of smartphones on classroom concentration and engagement in

lectures. Moreover, 64% of the participants perceive that smartphones make it easier for them to procrastinate.

#### 4. Harnessing Smartphone Potential Energy to Aid the Construction of University Learning Organizations



In the field of higher education, the advent of smartphones has significantly altered the landscape of learning organizations, providing unprecedented opportunities for continuous learning and knowledge sharing. Smartphones play a pivotal and transformative role in enhancing the characteristics of learning organizations, as reflected in the following aspects.

##### 4.1 Cultivating a Learning Atmosphere: Mobile Educational Applications (Apps) Facilitate Continuous Learning and Knowledge Sharing

As a multifunctional learning platform, smartphones have revolutionized the way students and educators access and share educational resources. Educational applications (Apps) have become gateways to knowledge, including Massive Open Online Courses (MOOCs), professional forums, and academic journals, which are now readily available to learners anytime and anywhere. This democratization of knowledge fosters a culture of continuous learning, where students can engage with content unrestricted by geography or time. For instance, leveraging smartphones to build learning communities, the Youth Grand Learning App is highly popular. In English teaching, educators can establish dedicated learning groups on platforms such as WeChat or QQ, sharing the latest teaching materials, including language learning resources, cultural insights, and explanatory videos on knowledge points. These groups become vibrant communities where students can ask questions, participate in discussions, and even attend small online seminars. These initiatives not only promote the formation of collaborative learning environments but also encourage the sharing of insights and experiences, creating a rich learning atmosphere.

##### 4.2 Cultivating Learning Abilities: Relay Check-in Software and Love Writing/Correction Websites Enhance Self-Management and Innovative Thinking

Smartphones enable educators and learners to adopt a more systematic approach to understanding the learning process. The use of relay check-in mini-programs (such as Relay Butler, Dragon Art Show, Group Relay) promotes the enhancement of learners' self-management abilities. Love Writing iWrite, as an English writing teaching and review system, continuously popularizes educational resources with digital means and technological innovation, making the dream of "everyone can learn, everywhere can learn, anytime can learn" illuminate the world. Providing

personalized guidance based on individual writing abilities and thinking power, nurturing students' learning abilities in essay writing and correction, and improving students' thinking and innovative abilities. In the context of English courses, teachers can use smartphone-based learning analytics to monitor students' learning activities, such as the time taken to complete assignments and assessment results. By analyzing these data points, educators can gain insights into the effectiveness of their teaching methods and adjust strategies accordingly. This data-driven approach significantly enhances learning outcomes.

#### **4.3 Shaping Organizational Culture: The Transition of Interpersonal Relationships from Subjective Interpersonal Connections to Objective Neutrality**

The widespread use of information technology has led to a transformation in organizational culture and instant messaging services and social networking platforms enable direct communication between employees and leaders at all organizational levels, [9] with the widespread adoption of smartphones causing interpersonal relationships to shift from a focus on subjective interpersonal connections to objective neutrality, and organizational relationships to evolve from linear hierarchical structures to flat structures.

The following is an interview record with student WQ.

"Previously, it was crucial to maintain good interpersonal relationships, as much information was unclear, and opportunities for things like buying train tickets home or participating in learning training were often missed once known. Now, it's different; many matters are organized and announced within smartphone mini-programs, with information flowing smoothly, making interpersonal connections less important."

"Before, one had to maintain a good relationship with the class monitor to gain learning training opportunities. For movie tickets, due to limited availability, one often needed to be on good terms with the class monitor to secure a ticket. In reality, ordinary students interact more with group leaders than with class officials, and without familiarity, opportunities and information might slip away."

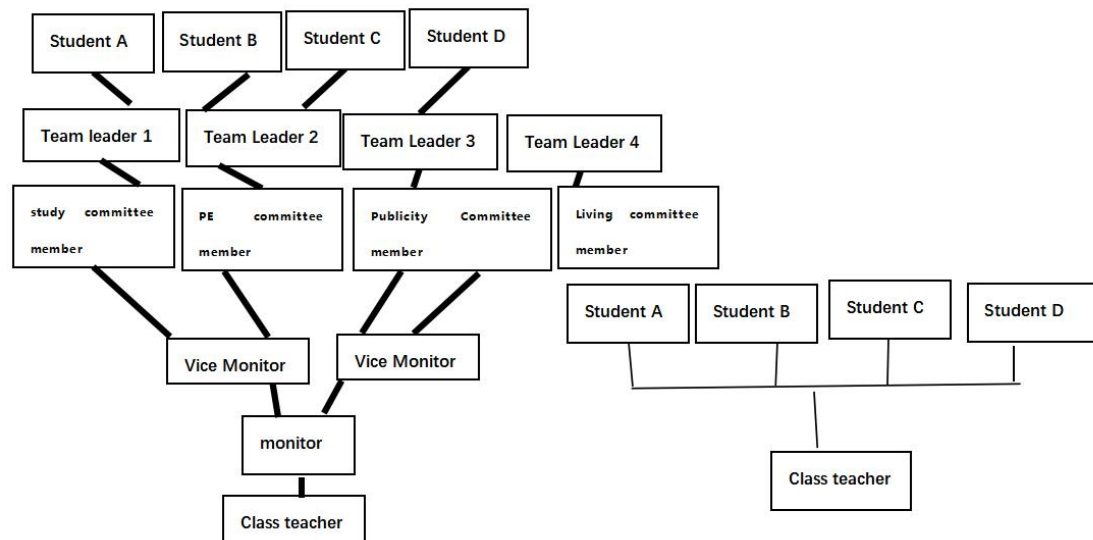
"Now, with the support of smartphones, everyone can purchase train tickets on the 12306 website, and for movies, one can buy tickets directly from Maoyan APP at any time, with the number of tickets sold and remaining clearly displayed. The discretionary power of class officials is being dispersed and weakened by informatization technology."

It is evident that interpersonal relationships are transitioning from being relationship-based to role-based, and the conventional ways of doing things are correspondingly shifting from subjectivity to objectivity. Taking a school class as an example, the organizational relationship structure is as follows (see Figure 2). It is clear that the organizational structure is evolving from a tree diagram to a flattened model. As a result, the organizational approach has achieved a leap from management to governance.

#### **4.4 Exercising Leadership: Realizing Instant Recognition and Real-Time Motivation, Providing Directional Guidance**

Smartphones have become a powerful catalyst for learning organizations. In classroom teaching, teachers can effectively recognize and motivate students using smartphones in the following ways. First, various educational applications and games can be used to increase students' interest in learning. For example, some applications offer a points system, where students can earn points by completing learning tasks, stimulating their engagement and competitive spirit. Second, through instant software on smartphones, teachers can quickly provide students with positive, real-time feedback and encouragement, such as "Great job!" or "Keep it up!", which can boost students' self-confidence and motivation to learn. Additionally, sharing students' success stories and progress in learning English within WeChat groups and other learning communities can inspire other students to follow suit. Furthermore, interactive learning through smartphones, such as online Q&A and group discussions, allows students to experience the joy of learning through participation.

Establishing learning groups enables students to engage in group learning through smartphones, encouraging and helping each other to make collective progress. By providing personalized learning resources and suggestions based on each student's learning progress and abilities through smartphone applications, students feel recognized and supported by their teachers, which further motivates them to make greater strides in their learning. As long as smartphones are used for motivation, focusing more on students' intrinsic motivation and personal growth, students will immerse themselves in a learning organization atmosphere to engage in autonomous and efficient learning. In this way, smartphones play the roles of thought leaders, learning motivators, and learning facilitators.



In summary, the application of smartphones in higher education teaching has not only enhanced learning and innovative abilities but also shaped a new type of organizational culture, constructing new organizational relationships and creating a more positive, open, and inclusive learning environment. With the continuous advancement of technology, smartphones will continue to play a unique role in the field of education, injecting new vitality into the development of learning organizations.

## 5. Summary

Smartphones have indeed significantly altered traditional organizational culture, especially in the field of education. Although the sample size selected for this study is not large enough and lacks richness, it can be said to have a certain degree of representativeness. Traditional classroom organizational student relationships typically exhibit the following four characteristics: First, face-to-face communication: In the era before smartphones, student interactions and engagements largely depended on face-to-face communication, which helped establish deeper interpersonal relationships and teamwork. Second, centralized information dissemination: Teachers were the primary sources of information dissemination, with students receiving knowledge through classroom lectures and blackboard notes, emphasizing the authoritative status of teachers. Third, fixed learning time and space: Students' learning activities usually took place at specific times and locations, such as classrooms, which helped form a stable learning environment and order. Fourth, limited resource acquisition: Students' access to learning resources was relatively limited, mainly relying on libraries, textbooks, and materials provided by teachers.

In the modern digital era, smartphones have introduced the following four new characteristics to organizational relationships and student relationships: First, instant communication and online social networking: Smartphones enable students to communicate in real time through instant

messaging software (such as WeChat, Whats App, etc.), changing traditional communication methods and making information dissemination more convenient and rapid. Second, personalized learning paths: Students can access a wealth of online resources through smartphones, such as educational apps and online courses, choosing learning content based on their own learning pace and interests, promoting the development of personalized learning. Third, dispersed learning environments: The portability of smartphones allows students to learn from any location, breaking the traditional limitations of learning spaces. Fourth, information overload and attention dispersion: The vast amount of information on smartphones may lead to students' attention being divided, affecting learning efficiency and classroom participation.

From a relational comparison perspective, the impact of smartphones on the primary relationships in university English classrooms, such as student-student and teacher-student relationships, includes the following. Student-student relationships: Smartphones facilitate instant communication among students but may also lead to a reduction in face-to-face interactions, affecting the establishment of deep interpersonal relationships. At the same time, students may prefer to conduct group discussions through smartphones rather than face-to-face

Student-Student Relationships: Smartphones facilitate instant communication among students but may also lead to a reduction in face-to-face interactions, affecting the establishment of deep interpersonal relationships. Additionally, students may prefer to engage in group discussions through smartphones rather than face-to-face, which could impact the quality and depth of teamwork. Teacher-Student Relationships: Teachers can communicate more conveniently with students and provide personalized feedback through smartphones. However, there is also a risk that students' over-reliance on smartphones may reduce classroom interaction. Teachers need to adapt to new teaching methods, such as using smartphones for interactive teaching, to maintain and enhance the connection between teachers and students.

In summary, smartphones have brought both convenience and challenges to education. Educators need to find a balance, fully utilizing the advantages of smartphones and harnessing the positive Smartphone potential Energy of mobile phone technology while managing potential negative impacts to promote effective learning and teaching.

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