

Feasibility Study of Take-out Self-pick Cabinet on Campus

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Abstract

The stable development of takeout market in college campuses has promoted takeout to be one of the main forms of contemporary college students' dining. However, a series of problems (such as takeout being stolen and spoiled, etc.) have also been exposed in its development process. Therefore, it is extremely important to seek an effective solution. Questionnaires were distributed to students of Southwest Minzu University and a large number of data analysis were conducted. In combination with SWOT analysis, the feasibility of selling self-service cabinets on campus was further studied. The results show that most students think that the introduction of take-out self-pick cabinet is a good way to solve the problem, and THE SWOT analysis shows that the take-out self-pick containers are more feasible on campus.

Keywords

campus take-out; Intelligent Take-out Self-pick Cabinet; SWOT.

1. Introduction

With the booming of Chinese takeout industry, more and more people are choosing to order their meals online. College students are one of the main consumer groups in the takeout industry, and the number is increasing year by year. Unfortunately, a series of bad phenomena, such as campus takeout theft, keep appearing.

In order to solve the problem of takeout theft frequently occurring in college campuses, we can design an intelligent takeout self-pick cabinet and corresponding WeChat small program based on embedded and Internet + android application development.

According to the needs of users, based on the existing domestic take-out self-pick cabinets enterprise project, the self-pick cabinets are designed to be more suitable for the use of students. The purpose of this paper is to study the feasibility of the takeout to the cabinet in the campus, using questionnaire method to research the Southwest Minzu University students' takeout demand and attitude, combined with the literature survey method to research the takeout industry present situation and development trend and college takeout industry analysis, on the basis of these results, the comprehensive SWOT foreign sell to the cabinet on analysis of the feasibility study.

2. Analysis on the Development Trend of Chinese Takeout Market

2.1. Analysis of the Current Situation of Takeout Market

With the booming takeout industry, more and more people are choosing to order their meals online. The continuously increasing transaction volume of takeout orders has attracted more and more merchants to enter online takeout platforms, promoted the integrated development of online and offline in the catering industry, and broadened the consumption application scenario. This development trend has also become a major driving force for consumption upgrading. The development of take-out food not only conforms to the current pace of life, but

also creates a large number of employment opportunities, injecting new strength into the development of the entire catering industry.

2.1.1. Trade Volume Increases Year by Year

According to the *Survey and Research Report on Chinese Takeout Industry* jointly released by the Meituan research institute and the China restaurant association, the transaction volume of China's food delivery industry reached 461.4 billion yuan in 2018, up 55.4% year-on-year. By 2019, the transaction volume of takeout has exceeded 600 billion yuan, reaching 603.5 billion yuan, up 30.8 percent year-on-year. Takeaways account for an increasing proportion of consumption.

2.1.2. The Penetration Rate of the Industry Continues to Rise

With the continuous and rapid increase of the market scale, the penetration rate of the take-out industry is constantly improving. According to the Meituan research institute and the China restaurant association, the penetration rate of China's take-out food industry was 10.8% in 2018, and reached 14.2% in 2019, with an increasing growth rate.

2.1.3. The Continuous Improvement of Distribution Quality

Delivery quality includes delivery time, delivery staff's service attitude, delivery price, packaging, etc. These factors will directly affect the transaction rate of consumers ordering takeout [1]. Good delivery quality is conducive to the establishment of good reputation of merchants. Nowadays, delivery platforms are equipped with just-in-time (JIT) and delivery evaluation, etc., all of which can guarantee the protection of consumers' orders. At the same time, whether it's Meituan takeout or ele. me, it's crowdsourcing. In the crowd-sourcing mode, the platform consolidates orders in the order pool according to the delivery route, type of goods and other information, thus reducing the repeated labor time of delivery personnel[2] and thus shortening the delivery time. The delivery box made of thermal insulation material can also guarantee the delivery quality to a certain extent.

2.1.4. The Quality of Take-out Food Varies Widely

The packaging of take-out food is mostly made of plastic products, and some foods use gutter oil or excessive additives, which do not meet food health standards. Long-term consumption of take-out food may cause health problems[3].

2.2. China's Take-out Market Industry Development Trend

2.2.1. The Overall Trend is more Pronounced

The development of takeout industry has entered its fifth year. China's first-tier cities are facing fierce competition and a wave of brand changes, and the market has been basically saturated. As the penetration rate of take-out becomes faster and faster, the take-out market in the future will gradually shift from the first and second tier to the third and fourth tier, and from the city center to suburban counties and townships.

2.2.2. Healthier and Greener

Due to the frequent occurrence of food delivery quality problems and the frequent news of unqualified vendors, relevant departments in China are constantly stepping up to improve relevant laws and regulations and industry rules and regulations. Strengthen the norms of the industry of foreign sales, strictly check the quality of foreign sales and services, intensify the crackdown on illegal crimes, increase the cost of violations so as to ensure the safety of consumers' lives and property; Improve takeout packaging materials, seek greener packaging materials, and encourage consumers to choose tableware free.

2.2.3. No Distribution

In 2018, Ele. me platform was approved to use drones for real-time delivery in Jinshan Industrial Zone in Shanghai, which is the first batch of uav real-time delivery routes in China[2].

The Meituan's driverless car is also in use in some areas. At present, the mass production of unmanned delivery vehicles has become a trend, so in the future, unmanned instant delivery will become a development trend of the take-out industry.

2.3. The Development Trend of Take-out Market on Campus

2.3.1. Study on College Students' Consumption Psychology

According to the student management mechanism of institutions of higher learning in Our country, college students in our country basically live on campus and eat in the canteen, and the canteen dishes are often relatively single, poor taste, the canteen queue and other problems shake the psychological college students choose to eat in the canteen. According to the literature[4], it is easy for college students to pay attention to whether the dishes are diversified and whether the taste is in line with the taste, followed by the price. Later, in this process, they will pay more attention to the service attitude, and finally, the health problem. In addition, some students also have the eating habits of ethnic minorities, such as the differences between the north and the South. However, the food color, taste, price and waiting time of takeout all meet the standards for college students to choose food, so college students have become a huge consumer group in the takeout industry.

Another important factor in choosing take-out food or canteen is the living habits of college students. Some college students often have a chaotic life, so they tend to miss meals in the canteen, or are too lazy to go to the canteen, so they choose to order take-out food by mobile phone and then go downstairs to receive meals.

2.3.2. Take-out Theft

Due to the college campus regulatory rules, the rider is no way to delivery to dormitory doorway, and college students because there is no class, or sometimes things can't delay and rider handover delivery face to face, so there are a lot of time delivery member is put students takeout designated place, such as hanging in the dormitory gate railing etc., campus take-away stolen event happened then, regardless of the back is the cause of the other students take the wrong delivery or riders to the wrong address, frequent campus take-out stolen events to attract the attention of the students.

However, in spite of the possibility of a certain probability of the take-out being stolen, more than half of the students still did not reduce the probability of ordering take-out after questionnaire survey.

2.3.3. The Development Trend of Takeout Market on College Campus

Besides residential areas and office buildings, schools are the most places to order take-out food, so students account for a large proportion of consumers in the take-out food industry. In addition to the single canteen, students lazy, campus take-out is inevitable.

From the perspective of merchants, in order to get more orders, they need to compete for customers through innovative sales methods, such as full discount, new users immediately reduce, etc., while the competition among merchants will benefit consumers the most. That's why a large portion of takeout food costs about the same as a meal in a canteen.

Therefore, it can be roughly concluded that the development trend of the take-out industry on college campuses in the future may continue the development trend of the overall take-out industry, and the turnover will gradually increase, but the take-out industry still tends to be saturated.

2.4. Southwest Minzu University Students of Self-pick Acceptable Degree

2.4.1. Management of the School's External Sales and Enrollment

Table 1. The take-out management mechanism of Southwest Minzu University

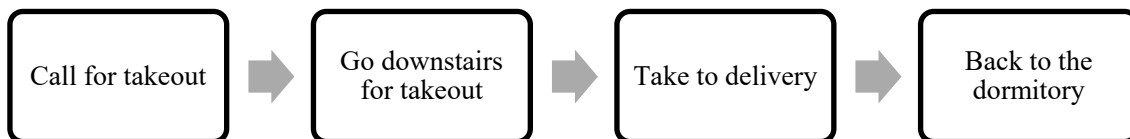
Time quantum	Rider delivery modes	Delivery mode of takeout	The delivery time	Risk of takeout theft	Shipping fee
By December 2019	Motorcycle	To the dormitory building and to the students	Short	Low	Low
After December 2019	Walking/cycling	Put it on the fence below the dormitory (no direct contact)	Long	High	High

It can be concluded from the table that,

- The school has no objection to students ordering takeout;
- The school requires riders to only deliver takeouts under the dormitory building/outside the courtyard, not to the dormitory; Students must go downstairs to get takeout;
- Riders are required to walk/bike to school, resulting in higher delivery costs and longer delivery times;
- School restrictions on riders cause changes in the delivery mode of riders and increase the risk of loss of takeout.

2.4.2. The Way Students Receive Takeout

Plan A:



Plan B:

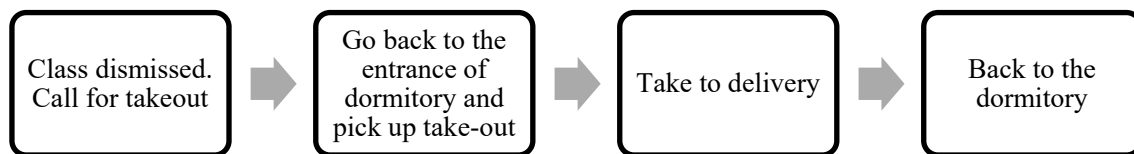


Figure 1. The way students at Southwest Minzu University accept take-out

In view of the school's management of take-out, students will experience the process of "picking up takeout at the dormitory gate" no matter how they receive takeout in mode one or mode two.

2.4.3. Student's Acceptability to Self-pick Cabinet

The process of "self-pick" needs to be accepted by students,

- Pick it up at the entrance of dormitory;
- Self-service take-out;
- Open Wechat program, scan code to open the box;

From the figure 1, we can get the following points,

● **Students have a high acceptability of the process of picking up take-out at the entrance of dormitory**

Under the long-standing system requirements, the process of going downstairs to get takeout has become the premise of ordering take-out. Since students choose to order takeout, it means that they accept going downstairs to get takeout. There was also no direct link between how often students ordered food and whether they needed to go downstairs.

● **Students' acceptability of picking up take-out by themselves (i.e. without direct contact with the delivery staff) is higher**

After December 2019, the delivery staff changed the delivery method to put the food on the fence under the dormitory building and informed the students to go downstairs to get it by phone. In this process, there was no direct contact between the students and the delivery staff, so the students had no rigid requirements for receiving the food in person and were more acceptable to pick up the food by themselves.

Therefore, the acceptability of students' self-pick is generally high, and the process of "self-pick" is theoretically feasible.

3. Feasibility Study of Take-out Self-pick Cabinet on Campus

3.1. Analysis of the Present Situation of Take-out Self-pick Cabinet on Campus

At present, the take-out self-pick cabinet has been introduced to some colleges and universities in China. "Shuangti" is one of the products launched by Shenzhen Kplocker Information Technology Co., LTD. In March 2018, it was introduced into Shenzhen University for the first time with good results. In March 2019, Zhuhai College of Jilin University also introduced it to the campus. So far, "Shuangti" food delivery cabinets have been introduced to 16 universities including Nanjing Audit University, Guangdong Ocean University and Liaoning Normal University. They have received a good response and are widely welcomed by students. Its market remains to be explored. In order to further understand the status quo of self-pickup counters in the campus, the students of Southwest University for Nationalities were investigated on take-out related issues through online and offline questionnaire survey.

As can be seen from the figure 2, in the survey sample, more than one-third of the students order takeout once every half a month to once a month, nearly one-third order takeout once a week to three times a week, nearly 20% of the students order takeout more than once a day on average, less than 10% of the students have not ordered takeout. According to the sample, more than 90% of students in the Southwest Minzu University order takeout, and nearly half of them order takeout every week. The takeout market is developing well in the campus of Southwest Minzu University.

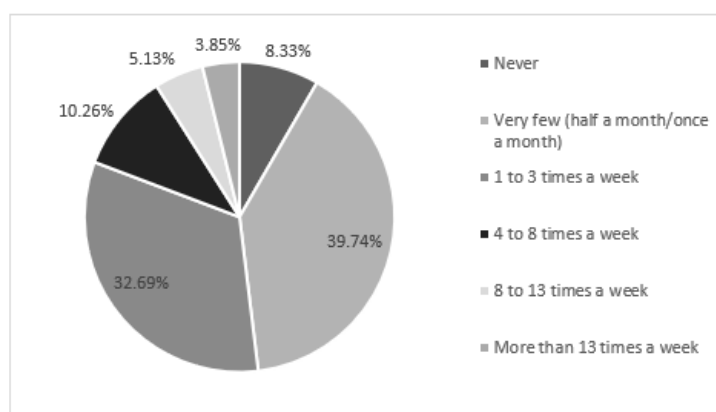


Figure 2. Southwest Minzu University students order takeout frequency

As shown in Figure 3, in the investigation and study, up to 15% of students have experienced a takeaway food theft event, and a very small number of students have had their takeaway food stolen for more than 5 times. As for the cognitive level of takeout theft, the survey results are shown in Figure 4. 92.95% of the sample students have heard of takeout theft, which indicates that the frequent takeout theft on campus has gradually become a common topic of discussion among students.

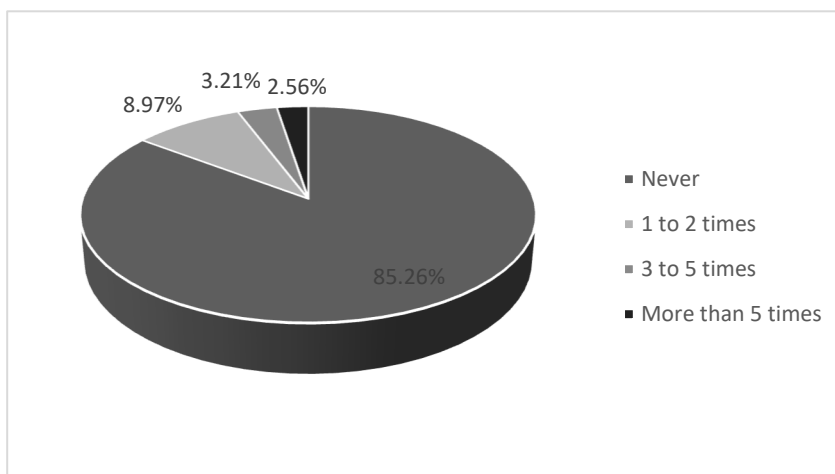


Figure 3. Frequency of student takeout stolen in Southwest Minzu University

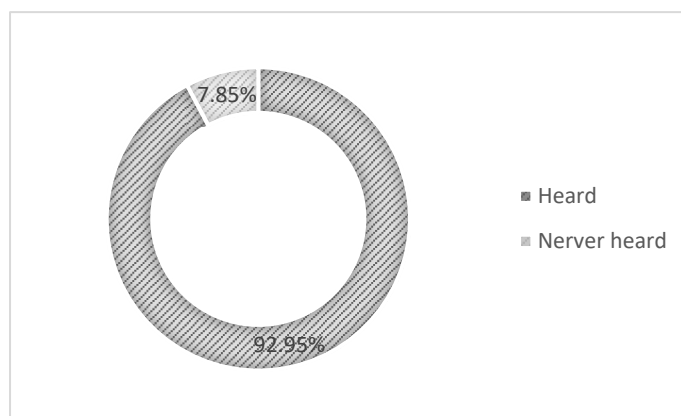


Figure 4. Southwest Minzu University students selling stolen event cognition degree

About students how to handle the take-away stolen events, the following investigation, after multiple response analysis was used to investigate the results shown in the table below, the samples have 75.6% of the students in the take-away stolen will choose with merchants/marki immediately after contact, ask them the reason, or to seek redress, 45.5% of students choose find thief investigation and monitoring, only 6.4% will ignore the phenomenon.

In this survey, open-ended questions were also set. From the answers of open-ended questions, three types of answers could be extracted: the first type was ignoring, the second type was finding the real culprit, and the third type was delivering food to the deliveryman face to face next time.

Therefore, it can be seen that college students will take different approaches to deal with the food delivery after it is stolen, among which contacting merchants or deliverymen is their first choice.

If the delivery is actually stolen by someone else, there is some loss from the merchant's or the deliveryman's point of view.

Therefore, the research results show that students' attention to the theft of takeout, their tolerance and the loss of merchants all lead to higher demand for takeout cabinets.

Table 2. Ways of students' takeaway theft in Southwest Minzu University

	Percentage	Percentage of cases
What do you do when your takeout is stolen?(Ignore)	3.6%	6.4%
What do you do when your takeout is stolen?(Contact merchant/deliveryman)	42.9%	75.6%
What do you do when your takeout is stolen? (Check monitor)	25.8%	45.5%
What do you do when your takeout is stolen? (Vent anger on social networking sites)	14.9%	26.3%
What do you do when your takeout is stolen? (Give bad reviews to merchants/deliverymen)	7.3%	12.8%
What do you do when your takeout is stolen? (Others)	5.5%	9.6%
Sum	100.0%	176.3%

Therefore, statistically speaking, it is feasible to set up take-out containers on campus. Of course, students should try their best to get their take-out as soon as possible, or choose to eat in the canteen, so as to effectively reduce the risk of take-out theft.

When it comes to the methods for students to prevent the occurrence of takeout theft, if there is no corresponding solution, 60% of students choose to reduce the frequency of takeout and eat more meals in the canteen. But when it comes to the option of take-out containers, more than half of the students think take-out containers should be placed outside the school dormitory gates to reduce the risk of takeout being stolen. Among the open options, most students think it is a good choice to pick up take-out food in time.

Table 3. Awareness of students' takeout theft prevention in Southwest Minzu University

	Percentage	Percentage of cases
What do you think should be done to prevent take-out from being stolen? (Eat less takeout and more in the canteen)	33.7%	60.9%
What do you think should be done to prevent take-out from being stolen? (Set up temporary takeout storage boxes outside the dormitory gate)	29.1%	52.6%
What do you think should be done to prevent take-out from being stolen? (Strengthen security measures, such as monitoring)	29.8%	53.8%
What do you think should be done to prevent take-out from being stolen? (Others)	7.4%	13.5%
Sum	100.0%	180.8%

Therefore, the statistical results show that it is feasible to put take-out cabinets on campus. Of course, students should also try their best to get their take-out as soon as possible, or choose to eat in the canteen, which can effectively reduce the risk of take-out theft.

3.2. SWOT Analysis of Take-out Cabinet

3.2.1. Strengths

● A huge demand markets

According to the Research of *China Undergraduate Education Quality Report*, there are 2,879 institutions of higher learning in China, and by 2019, there are 26,958,000 college students in total. Meanwhile, the rate of students' selling meal has reached 20-30%, the daily order volume of colleges and universities is nearly 7 million, and the daily transaction volume is nearly 100 million yuan. The market will continue to grow steadily.

According to the investigation and analysis, up to 15% of the students have experienced the takeout cabinets being stolen. The takeout cabinets are one of the effective ways to solve the problem, and the frequent theft has opened up the market for the take-out cabinets. At the same time, only 6.4% of the students were not investigated for the theft of takeout, which indicates that students attach more importance to the theft of takeout and have a lower tolerance, which leads to a higher demand for takeout cabinets.

● Combine online and offline

In the age of Internet, the take-out self-pickup cabinet combines online and offline, and uses WeChat program to realize the function of scanning code to retrieve items. At the same time, the self-pickup cabinet can meet the requirement of many people opening and closing cabinets at the same time, saving students' time of queuing to pick up items.

● The self-picking cabinet can solve the last 100 meters of delivery

Behind the rapid growth of orders in the take-out industry, the problem of delivery in the last 100 meters has been exposed: the take-out workers have to spend a lot of time waiting for students to pick up the food after they deliver the food to the designated place; Or the student should prepare to the designated place in advance, and wait for the delivery boy to deliver the food. If the take-out staff adopts the practice of Southwest University for Nationalities, that is, the take-out staff puts the take-out food on the fence below the dormitory building and calls the students to go downstairs to get it by themselves (no direct contact between the two parties), the take-out food may be lost or taken by mistake.

The 100-meter problem is particularly acute during the rush hour (e.g., lunch time, dinner time), resulting in a waste of resources. The self-picking cabinet can realize the function of "one order, one yard, and one box", which enables the delivery staff to put and the students to take, which can not only effectively solve the 100-meter problem, but also maximize the utilization of resources to some extent.

● Since the cabinet can solve the delivery of take-out problems

The food delivery is placed on the fence after being delivered to the destination by the delivery staff, which may easily cause the food delivery problems such as contamination (e.g. mosquitoes) and deterioration, etc. The self - lifting cabinet is a closed environment, which can effectively solve the problem.

● Can solve part of the emergency

Take-out self-pick cabinets can solve certain emergencies, such as the coVID-19 outbreak in 2020, which will expose college students to the risk of infection during meals after they return to school. The number of people ordering take-out food in the peak period (such as lunch and dinner) is large, so students tend to be crowded when taking take-out food, increasing the risk of infection. Combined with online and offline, the take-out self-service cabinet can realize the function of no waiting to pick up food, which can accelerate the flow of people to the greatest

extent, reduce the density of people and reduce the risk of infection. With the accelerated development of "isolation economy", the extension of takeout has become more extensive, from diet to daily necessities have entered the field of takeout. "Contactless delivery" is also being promoted constantly, and self-pick-up cabinets just meet these needs during the epidemic.

3.2.2. Weaknesses

- **Early popularity is not high**

Although the take-out cabinets have been implemented in 16 colleges and universities across the country, most of them are still not involved, and many students even know nothing about the take-out cabinets. In addition, in the Internet era, users have their own understanding of brands, and they are more inclined to make decisions on well-known brands, which is undoubtedly a disadvantage for new brands.

- **High input cost**

In the early stage of the delivery process, the input cost of a large number of take-out self-pick cabinets on campus is relatively high. In the case that the take-out self-pick cabinets have not formed a scale, the cost is naturally higher.

3.2.3. Opportunities

At present, Shenzhen Kplocker Information Technology Co., Ltd. has introduced "Shuangti" to 16 colleges and universities across the country, which has received a good response, indicating that the take-out cabinets have been widely welcomed by students. But at the same time, as the coverage of shuangti is not wide enough, the takeaway cabinet market is not saturated, so the market still needs to be explored, which is an opportunity.

In addition, "Shuangti" has some defects. According to students, the platform charges high fees and only has small programs to remind them after meals. College students have limited consumption ability, and most of their living expenses come from their parents. If the platform charges too much, students will be less motivated to order takeout. Secondly, if only WeChat program to the meal reminder, some students may forget to receive takeaway or overtime takeaway because they did not read the WeChat news in time, leading to takeaway cold, bad and other results. On the basis of the existing "Shuangti" self-pick-up cabinet, the problems existing in "Shuangti" can be solved, the platform use cost can be greatly reduced, the membership fee can be reduced to the economic range acceptable to most college students, and when the take-out is delivered to the meal, the user can be reminded to take the takeout by phone.

The management system for take-out in the Southwest Minzu University, as well as the acceptability of students' take-out, makes the implementation of take-out cabinets in Southwest University for Nationalities more feasible.

3.2.4. Threats

- **Peer Threat**

Since 2018, When Shenzhen Kplocker Information Technology Co., Ltd. introduced "Shuangti" to Shenzhen University for the first time, "Shuangti" has occupied a large number of take-out cabinets and possessed a large number of user groups and market experience, which has posed a threat to new brands lacking experience and market.

- **Uncertainty factor**

Uncertainty factors make the delivery to the ark of the use and management of the risk of the unknown, for example, to improve the management system of the campus to takeaway is likely to be foreign sell a threat to the cabinet, such as allowing delivery vans, allowed to school may lead to problems such as the use of delivery to the tank to reduce the number of, thus reducing the usage of the tank.

3.2.5. SWOT Conclusion

Based on the above analysis of the status quo and SWOT analysis, it is not difficult to see that the advantages of take-out self-pick cabinets entering the campus outweigh the disadvantages, the opportunities outweigh the threats, and the disadvantages can be overcome in effective management. For example, for the problem of low popularity, WeChat, QQ, weibo and other platforms are used for publicity and promotion. Although there are opportunities and risks for take-out cabinets to enter the campus, it is theoretically feasible and highly feasible.

4. Conclusion

In the next few years, the take-out industry on campus will become saturated, but the turnover is likely to keep rising. The stable development of takeout market in college campuses has promoted takeout to be one of the main forms of contemporary college students' dining. However, a series of problems (such as takeout being stolen and spoiled, etc.) have also been exposed in the process of its development. Therefore, it is extremely important to seek an effective solution. The introduction of take-out self-pick cabinets greatly improved the delivery efficiency of take-out staff, and at the same time catered to the needs of college students, which not only accelerated the flow of take-out staff to a certain extent, but also ensured the safety of take-out. In addition, the study of the existing take-out self-service cabinets entering the campus shows that college students have a good response to the take-out self-pick cabinets, and the feasibility of the take-out self-pick cabinets entering the campus is relatively high.

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