如何帮助不善于社交但又渴望建立更多链接的高中生提高社交生态位

How to help high school students who are weak in social skills but are eager to establish relationships to improve their social niche

摘　要

高中是社会认同和心智发展的重要时期。在中国，高中生正在面临来自同伴压力的严重社交问题。本研究致力于帮助社交能力不足但相与更多人建立链接的高中生，为他们提供摆脱孤独，融入学校社区的解决方案。通过分析影响高中生链接的关键因素，可以提供进一步的社交建议。研究表明，愿意与朋友度过更多空闲时间的高中生拥有更多的朋友。同时，学术成就和面部特征的相似性对于友谊的建立只有有限的影响。相同爱好，特别是运动和音乐偏好，是建立友谊的关键。

Abstract

High school is an important period for social identity and mental development. In China, students are facing serious social problems from peer pressure. The research aims to help high school students who are weak in social skills but are eager to establish connections, to find the solutions, enabling them to get rid of loneliness and integrate into the school and students. By analyzing crucial factors affecting high school students' friendships, further suggestions can be constructed. In conclusion, the longer leisure time students are willing to spend with their friends, the more friends they have. The result indicates that similarity in academic achievement and physical appearance have limited influence on friendship. The common hobbies, especially sports and music preferences, are instrumental in establishing friendships.

Social problem

At present, high school students in China are generally between 15 and 19 years old. When the physiological growth gradually tends to be stable, it is a very important period of mental development. Since socializing is an indispensable part of high school life, high school students need to deal with not only academic pressure, but also social pressure that can be seen everywhere in life. Society has also been highly concerned about high school students' stress status and sources. According to the conclusion of the *Comparative Study on Learning Awareness and Status of High School Students in China, Japan and South Korea* (China Youth & Children Research Center 2018) released by China Youth & Children Research Center in 2018, it is proved that the mental pressure of Chinese high school students is internalizing. The pressure is mainly from three parts, and one part is from peers. Some studies show that the relationship network in high school tends to be very complicated, which is very similar to what current high school students will encounter in the future, for instance, that of a professional workplace. Therefore, the social problems of high school students are particularly important for their future development. When the problem is getting more serious, it may even evolve into a psychological problem.

There is a concept in social relationships called "social niche". This concept describes the status and position of an individual in his or her community. In other words, if we regard the social relationship as a network, and every individual as a node in this network, the social niche can be described as the quantity of the flow that is going through a specific node. By this definition, the cause of "loneliness" can be phrased as having relatively few connections with other nodes, or having a low social niche.

In general, some students in high school are weak in social skills nowadays. They have the intention to establish some relationships, but they cannot enforce their connections with others to improve their social niche subjectively. Therefore, it is difficult for them to establish their self-identity and sense of safety as well as obtain recognition from the others in the community. Furthermore, this will have an impact on their psychological health, academic learning, and cooperation abilities. In conclusion, it is of social significance to help these high school students build more connections to improve their social niche. And the factors which can influence the number of connections are various.

Research problem

How to help high school students who are weak in social skills but are eager to establish relationships to improve their social niche?

Hypothesis

Chinese high school students with similar academic achievement, hobby, physical appearance, and longer time spent together are more likely to establish a friendship.

Academic achievement:

Students tend to form a friendship with students who have similar academic achievement with them. In the first scenario, two students with low grades will have the feeling of sharing the difficulty if they establish a friendship. In the second scenario, two students both have a higher grade, they will form a reciprocal relationship to improve their grade furthermore.

Hobby:

A similar hobby can provide many conversation topics to students, and students who share the same hobby may spend more time together on an activity. Ultimately, students who share the same hobby may have a higher possibility to form friendships.

Physical Appearance:

People prefer physical appearance that is similar to themself, so students with similar physical appearance may have a higher possibility to form a friendship.

Time spent together:

The longer time students spend together, the more activity and interaction will exist between them, and their relationship may become closer.

Literature review

As for the influence of different factors on the number of connections with other nodes, according to the current research, it is distributed in three aspects: homophily, heterogeneity and friendship expectations or criteria.

Homophily

Recently, a growing number of researchers have focused on questions of the relationship between sociability and homophily. "Homophily is the principle that contact between similar people occurs at a higher rate than among dissimilar people (Miller, Lynn, & James, 2001)". Thus theoretically, similar people tend to establish friendships due to the high contact rate. Here are some previous related studies for reference.

First of all, the classmates in the same grade or course, or has indirect friendship links (e.g., has the same friend) can build friendship links with each other more easily (Anna, Chandra & Kenneth, 2013). Researchers call these shared characteristics "homophily", which can reduce the transaction costs of identifying potential friends.

Nevertheless, there still has some arguments about the efficiency of homophily on the social network structure. For example, Gueorgi and Duncan find that "Social network formation is a complex process in which many individuals simultaneously attempt to satisfy their goals under multiple, possibly conflicting, constraints (2006)". Thus, homophily may play a weak role in relationships (Gueorgi & Duncan, 2006). They choose to focus on reflecting interpersonal relationships through the number of E-mail interactions and classify the data by the other characterization factors of the survey samples. But "Homophily is the principle that contact between similar people occurs at a higher rate than among dissimilar people (Miller, Lynn, & James, 2001)", so it is questionable to judge homogeneity simply by collating data from E-mail interactions.

Besides, the research from Miller, Lynn, & James (2001) also shows many different points of view on how the homophily influences the built of new friendship links. Therefore, the behavior of those people who have varied characteristics in terms of ages, backgrounds, social communities or even educational attainment, can also prove that "people generally only have significant contact with others like themselves, any quality tends to become localized in sociodemographic space. By interacting only with others who are like ourselves" (Miller, Lynn, & James, 2001).

All in all, this means that if we can apply the aforementioned homophily when choosing friends, it will help us to increase the efficiency and benefits when we social in the network.

Heterogeneity

Heterogeneity refers to people who tend to form relationships due to their complementary characteristics. A paper(Yaughn, 1999) whose author interviewed 24 male and 24 female college students studies the complementary relationship. By asking about their interpersonal relationship styles and their closeness with their same-sex friends, the study reports that women's close friends have complementary interpersonal relationships with them, but the opposite is true among men, although there is no difference between male intimacy and female intimacy. And these women usually participate in more activities with their close friends. However, the study believes that the results of the men's survey most likely come from their limited participation in activities with friends so that they did not realize whether they are complementary with their friends or similar. Thus, it is highly possible that their interpersonal relationships include complementary relationship. This study illustrates that most of the intimate relationships between women are complementary and predicts that some men will have the same relationship. So, heterogeneity is an important factor in improving the quality of relationships.

Friendship Expectations or Criteria

There is a wealth of research on different rules or expectations for making friends. As a result, they have diversed definitions of the dimensions of friendship expectations. This also results in a large variation in the number of dimensions. As early as 1977, Bigelow asked 480 early adolescents to write an essay to describ their expectations for good friends(Bigelow 1977). He obtained 21 dimensions of expectations, including common interests and hobbies, the similarity of personal ability and self-worth, etc. However, some studies (Zarbartany, Conley & Pepper, 2004) argue that there are only two dimensions: communal (connection) and agentic (social prominence) needs. The reason to cause the different results between these two kinds of study is the definition of dimension. The previous one uses very detailed categories. On the contrary, Zarbartany, Conley, and Pepper try to summarize the dimensions into a universal one, which is easier to further the study that can find the relation between dimensions of friend expectations and the quantity of the connections.

Although a lot of previous studies (e.g., Bigelow & La Gaipa, 1980) focus on relational and socio-emotional qualities of friendship, recent studies also explore personal aspects, such as personal attractiveness and wealth. Zarbartany, Conley, and Pepper also pointed out that to become friends is not a congeneric experience; it is different from person to person, requiring different individual's personalities to build. In 2007, Vigil designed a questionnaire containing 117 items for friendship (Vigil 2007). Participants were asked to assess the trait preferences of two different people: the ideal friend and another hypothetical friend with different characteristics, which can also be divided into two types. One is the "interpersonal

investment traits signifying willingness to invest in a reciprocal relationship": cooperation, responsibility and sense of humor, etc; the other is the "personal capacity traits": creativity, intelligence and education, etc. One of the conclusions is that people regarded "interpersonal investment traits signifying willingness to invest in a reciprocal relationship" is more important than "personal capacity traits". And no gender differences were found to influence the results. Thus, cooperation, responsibility, sense of humor and other related abilities are admired by people. Therefore, the "interpersonal investment traits signifying willingness to invest in a reciprocal relationship" may increase the quantity of the connections, which is helpful for the following research.

Among the three factors, homophily can improve the efficiency of establishing and maintain friendships. The heterogeneity can improve the quality of friendship. The friendship expectation indicates the importance of reciprocal relationship, and further indicates the influence of reciprocal relationship to friendship when it serves as one of the friendship expectations.

Materials/Methods

Current research approaches generally analyzed that there are three main factors causing people to build connections: homophily, friendship expectation, and heterogeneity. Homophily and heterogeneity can improve the efficiency and quality of social and establishing friendships. And the friendship expectation indicates the importance of reciprocal relationship, and further clarify the influence of reciprocal relationship to the friendship when it serves as one of the friendship expectations. However, considering that friendship expectation is a subjective value, it is hard to evaluate or category different kinds of expectations, so no statistical conclusions can be formed. Therefore, the main focus of research is how homophily and heterogeneity of people affect their possibility of making connections.

To prove the possible factors, play an important rule in making friends or building connections, a huge amount of data is needed. In this way, a questionnaire is the best method to collect and classify the data. To get a general conclusion of high school students, data are expected to be diverse among different schools. Thus, an online questionnaire can perfectly meet these needs.

The research's online questionnaire was designed for getting real-life data from high school students about how homophily and heterogeneity affect their friendships. Questions include information of the user, whether certain similarities occur in his/her current relationship and his/her friend's information. One user is asked to at least fill up one friend, at most each can submit 3 friends' information.

Considering our objective users are high school students, all the interviewees are high school students or people who have attended high school. For the people who are already graduated from high school, we asked them to recall their memories of their high school life. To confirm this, the first question of the questionnaire is the user's current grade.

To verify which kind of homophily or heterogeneity affects high school students' relationships in which level, the main idea of the questionnaire is to lead the user's reflect on their similarities with their high school friends. By examining the frequency of different similarities appear, further infer can be constructed that the similarity with the greatest frequency may be the strongest factor of being friends.

The dimensions that reflect the homophily and heterogeneity of high school students should be highly-related to the characteristics or concerns of high school students. The most significant attribute is that most high school students spend most of their time on learning. Therefore, the attitude and achievement of learning is a strong label of high school students [citation needed]. Other related factors include extra-curriculum hobbies and facial similarities.

The achievement of learning is the most important thing in high school students' life. All the authorities judge individuals by their grades or ranking. Thus, academic achievement is a variable that contains social tendency and expectation that students have higher academic achievements are regarded as "good students." So, academic achievement is important evidence for judging others for high school students since it shows the "quality" of a student. In the questionnaire, the achievement of learning is defined by the rankings of the user and his/her friend. And, the attitude toward learning is defined by one's individual learning time divided by one's total free time after school. Each person in the

interview will offer his/her own degree of learning attitude and achievement of learning, and his/her friend's achievement of learning.

The question about extra-curricular hobbies includes different kinds of hobbies: sports, video games, music, literature, films, star, and their personal views about the world. These hobbies are the common things high school students do or talk about together after class. People taking this questionnaire will answer whether they have a specific preference for the hobbies listed below and if they and their friends have the same preference in these hobbies.

Aside from the questions on the learning and hobby, the questionnaire also focuses on the similarity of physical appearance. To evaluate the similarities of appearance between friends, an online-website on Tencent AI Open Platform is provided for subjects. The interviewees are expected to submit two photos—he/she and the friend's—and then a feedback is provided by the website as a number from 0 to 1 how much the two faces are similar. The link of the website is provided above the description of that question and the subjects are expected to fill in the degree of their facial similarities. However, considering it costs much more to answer this question, it is not a necessary question to finish the questionnaire.

Furthermore, the rest questions include the time subjects spend with their friends and other suggestions to help us improve.

The questionnaire is posted on the team's public account with a whole passage describing the social problem we found and what can people get from submitting the questionnaire. Immediate feedback would be given as a sentence that describes his/her relationship pattern. However, the diagnosis of relationship patterns is not generated by the psychological method. The diagnosis contains 2 literary images that can be interpreted in various ways. The literary images are chosen randomly so the way the subject interpret this feedback shows his/her understandings of their relationships.

Result

There is no significant relationship between facial appearance and building connections. The average similarity of the sample is 22.6%, and the standard deviation is 21.63%. This suggests that there is no significant tendency to appear in the sample. The conclusion can also

find its roots in a study constructed in 1988 that "Physical appearance was not at all related to friendship "(Johnson, 1989).
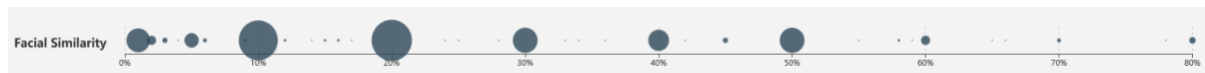
Music preference and sports would significantly affect the friendship. There are both 32.89% of subjects have chose that they have common music preference and sports with their friends. The research constructed in 2017 also suggests that "adolescents were expected to select friends based both on a similarity in externalizing behavior and music genre preference." (Franken, 2017)[2] It is also clear that for "sport, positive friendship quality dimensions were directly associated with perceived competence and indirectly associated with enjoyment, anxiety, and motivational orientation" in a study constructed in 2018. (Reichter, A., 2019)

In the cases who chose "common music preference" with their friends, 90% of them chose that they have straightforward music preference. This suggests that they considered the same music preference as dominant criteria when selecting friends.

There is no significant relationship appear between film preference or idol preference and friendship. Only 10% and 13.15% of people chose that they have the same film preference with their friends. However, this may be affected by the characteristics of the sample. In general, the sample students are(were) the top 30% of the class rank. This may lead to that they don't often watch TV or films, that they may not familiar with idols. There is much researches focus on the relationship between personality and movie preference, but further evidence is still needed to conclude.

In addition, by comparing data from high-popularity subjects (the number of friends >= 30) and the sample, further conclusions can be constructed. The average of free time at weekends for popular subjects is 25% higher than the sample.

Time Devoted To Friend
The students with more friends tend to devote more time to their friends

The time devoted to a friend, which is calculated by the ratio between time spends with the friend and the free time(24-LearningTime-FreeTime). The IQR of time devoted to a friend is around 0.1853, in other words, students spend around18.53% of their free time with their friends.

The data sample of students that have more than 30 friends at school has an IQR of time devoted to a friend around 0.2677, which means they spend around 26.77% of their free time with their friends.

A different of 8.28% time devoted to a friend is found between the IQR of all data samples and the popular students(students with more than 30 friends at school).
Even though this is not a direct correlation. But it generally indicates that students who willing to spend more free time they have with their friends, the more friends they have.
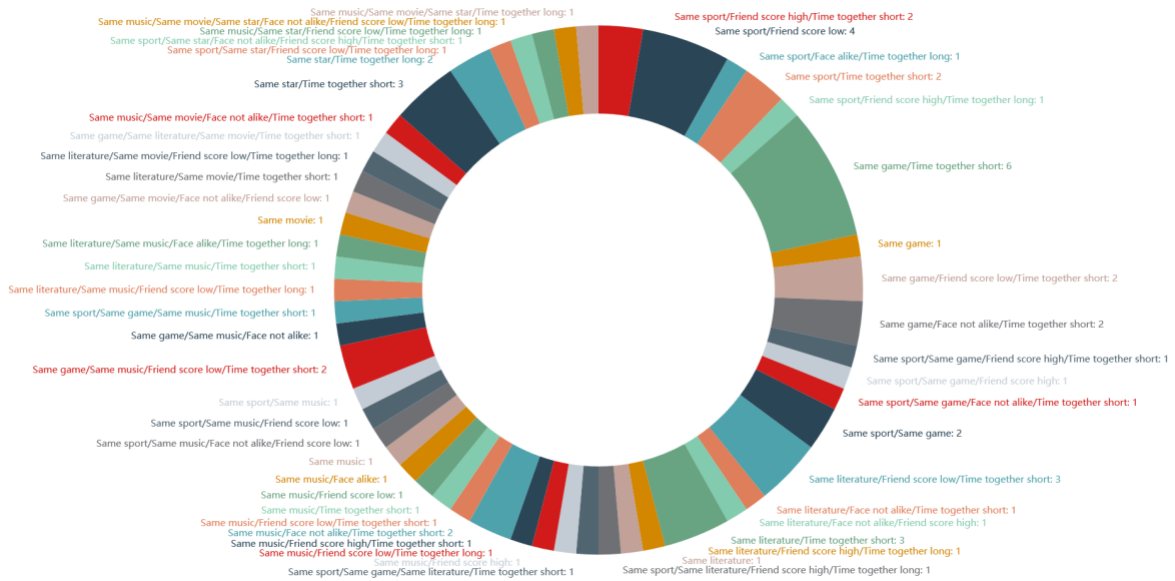

academic achievement
Base on the correlation between the academic achievement of both parties in the friendship which value is 0.1235, we can find that there is no relation between friendship link built and the academic level.
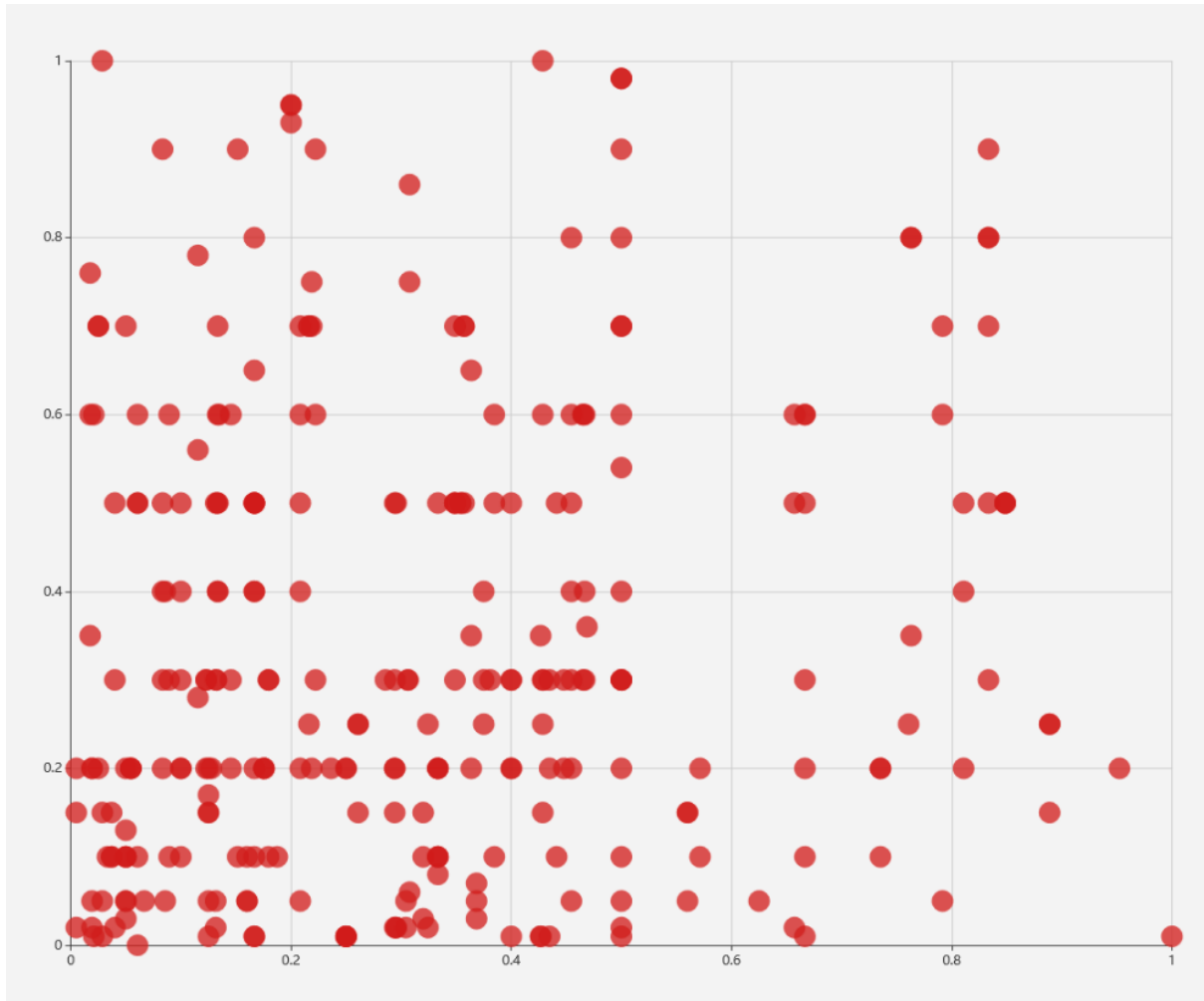
(Figure of scatter plot. X-axis: rank percentage of self; Y-axis: rank percentage of friend.)

Discussion

The correlations in the result help the researcher gain a further and better understanding of the formation of friendships. Even by understand only parts of the mechanism behind the formation of friendships, these results can still help people, especially Chinese high school students, to build and improve their relationships, improve their social niche, and ultimately eliminate their negative psychological reactions toward social with others.

From one of the findings in this study, it suggests that Chinese high school students may make friends with those are match with their friendship expectations, especially those who have similar taste of music and sports. This is because they can spend more time doing something they commonly love and get along well with each other. Other studies also regard common interests as one of the friendship expectations (e.g. Bigelow 1977).

The result also reveals that students' academic achievement is not a factor which is instrumental to the friendship formation. From the data, Chinese high school students have friends who have different academic performance or achievement. This result is different from previous studies. Most of the results nowadays distribute that academic achievement has a significant impact on friendship (Wentzel 1991 & Chen1997 & Mowei 2003 & Wentzel 2017). The reason to obtain such a result probably is that the expectation for friends might change as the value and society or age change (Bigelow 1977). The finding in this study could possibly be a sign of Chinese high school students changes their value on their expectations, and lead to the result of academic achievement have limited influence on students' friendships. Researchers still need more study to confirm this possible explanation.

What's more, the result of this study shows students only have low similarity to their friends in physical appearance. A possible explanation for this result is that students only pay little attention to others' physical appearance as they are forming friendships. Therefore, the homophily of physical appearance has a small influence on friendships. Even though the influence homophily in a physical appearance on friendship had rarely been studied by other researchers. but the finding assists other researchers to gain an insight into how physical appearance influence students relationship and actions.

Last but not least, another finding from the study suggests that students with more friends tend to devote more time to their friends. It is easy to understand that one person will spend more time with their friends if they are close in relationship.

This study uses an online open survey as the data source, which means some uncertainties are not under the control of researchers. The study's targeted subjects are Chinese high school students, but in the description of the survey, we asked the responder either must be a high school student, or they need to recall their experience in high school if they already graduated from high school. We include the data of people who recall their experience in high school to enlarge our data sample, in order to obtain the amount of data we need. Previous studies had shown people have some bias when recalling their memory, the farther past people recall, the more bias there is. (Protzko, 2019)

Since we did not ask the age of responders, this bias may have an unknown influence on our data sample.

Besides the bias from memory, another possible bias came from the physical limitation of the online survey. It could only reach to the study who access to the internet. China has different internet access rates and time across different areas, especially between urban and rural areas. (National Bureau of Statistic., 2019). Therefore our data sample is limited geographically.

Researchers propose more studies should be done to confirm the conclusion that grade rank has a limited influence on the friendship of Chinese high school students. If so, this can be a great opportunity to study the change in Chinese high school students, and maybe discover the reasons that drive this change. On the other hand, this different finding discovered in this study could cause by the imperfect data sample. Only more study can find out.

Conclusion

In conclusion, the longer leisure time they are willing to spend with their friends, the more friends they have. The result indicates that similarity in academic achievement and physical appearance have limited influence on friendship. The common hobbies, especially sports and music preferences, are instrumental in establishing friendships.

An astonishing finding to the researchers is that in the environment of Chinese high school, academic achievement has a limited impact on friendship. This result is opposite to the previous finding. A possible explanation is that the expectation on friends have changed while Chinese society develops and students' value changes. But the reason for this change still needs more study to confirm.

Another finding is out of the 4 major factors, the common hobby is a significant factor of friendships, which is sports and music preferences. Since students share common hobbies also share similar conversation topics and possibly engage in the same activities. It is reasonable that they develop friendships with each other.

The results of the study can help researchers understand what factors affect Chinese high school students in the formation of their friendship and choices they will make to choose a friend. These are important to deconstruct the high school students in the social network. By understanding the impact of these factors, the researchers can set up a model of a high school social network. Through helping those high school students, who are weak in social skills but are eager to establish connections, to find the solutions, enabling them to get rid of loneliness and integrate into the school and students, this can avoid potential psychological problems and improve their ability to cooperate with their studies.

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