

# Is it Time to Introduce the “Precision Tutorial System” for Undergraduate?

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## ABSTRACT

**Objectives:** The aim of this study was to investigate the current situation with the undergraduate tutorial system in China from the students' perspective and to further improve that system for greater developmental benefits. **Materials and Methods:** We designed a 21-item questionnaire to analyze the current situation with the undergraduate tutorial system. It was administered to freshman, sophomore and junior students taking a pharmacy undergraduate degree. In all, 415 pharmacy students completed the questionnaire. We collected the data and categorized them into 12 groups before subjecting the data to statistical analysis. We identified the common and different points (such as the most popular response options) between female or male students and by university year. **Results:** In all, 415 pharmacy students completed the questionnaire. We observed many differences in the popular choices between female or male students as well as among students in different university years. Even when the most popular options were the same, there were differences in the proportions between female and male students as well as among students in different years. **Conclusion:** There were considerable differences with respect to university year, genders and individuals. Regarding the tutorial system, students need help in different ways. We present the notion of the “Precision tutorial system”, whereby tutors should guide students according to the students' talents and preference as well as analyze and solve their specific problems. We believe it is imperative to introduce such a system.

**Key words:** Precision tutorial system, Undergraduate, Questionnaire, Pharmacy students, Individual.

## INTRODUCTION

The tutorial system for college students first appeared in England in the fourteenth century. At Oxford and Cambridge Universities, the tutor were academic tutor. The two universities implemented the undergraduate tutor system to provide one-to-three counseling for undergraduates. With that system, tutors played the role of student guides, providing direction to help the students make progress in learning and life.<sup>1,2</sup>

The tutorial system has also become very popular in Colleges and universities in the United States, other parts of Europe, Japan, Singapore, China, and other countries. Many institutions have achieved considerable success after implementing the

undergraduate tutorial system. However, problems have also appeared.<sup>2-7</sup>

As early as the 1920s-1930s in China, some colleges and universities applied the undergraduate tutorial system. Over the past decade, the undergraduate tutorial system in China's institutions has entered a new period of development and achieved great success.<sup>2</sup> In that time, over 200 colleges and universities in China have implemented the system and attained remarkable results.<sup>8</sup> Studies have shown that the proportions of scholarships, honorary titles, and academic paper rewards awarded to students with the undergraduate system were much higher than among those with the non-tutorial

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system. The tutorial system is the best supplement to teaching under the credit system.<sup>9</sup>

Many shortcomings and constraints with the current undergraduate tutorial system in China have, however, emerged. The system varies greatly in the country: it has different connotations in different institutions and majors.<sup>10-12</sup> For example, some tutors and students are unable to communicate well with one another; some are unclear about the responsibilities and needs of tutorship; support from institutions and other relevant departments is insufficient.<sup>13,14</sup> As a result, many colleges and universities are unable to achieve the desired results.<sup>15</sup> many questions have emerged: Should tutors and students choose from each other? Is it better for a student to have only a tutor at university or two or three? What kind of help do students need from their tutors? What do students think of the tutorial system?

Toward improving the undergraduate tutorial system and giving students more responsibility, we conducted a questionnaire survey; we then statistically and comprehensively analyzed the findings. We concluded that it is imperative to improve the current undergraduate tutorial system, and that “precision tutorship” would have a significant impact on student achievements.

## MATERIALS AND METHODS

To reflect the opinions of as many students as possible, we conducted an in-depth questionnaire about the undergraduate tutorial system among 415 freshman, sophomore, and junior students at the College of Pharmacy of a University in China. We applied survey methodology in the form of the questionnaire. The questionnaire was designed to generate quantitative data that could be subject to further statistical analysis. The participants were very largely females (294: 121). The participants' details were shown in Figure 1. The students completed it anonymously. The items related to such areas as tutor standards and problems probably encountered with the tutorial system.

We categorized the participant data into 12 groups: total, female, and male students group of college; total, female, and male group for each year. We statistically analyzed the collected data. We made a comparison of similarities and differences between total female and male students of college, and among total students of each year. The questionnaire items appear in Table 1.

The data were analyzed using GraphPad Prism 8.0. From the questionnaire results, the most popular choices of each item appear in boldface in Tables 2-6. We conducted Chi square test to determine whether

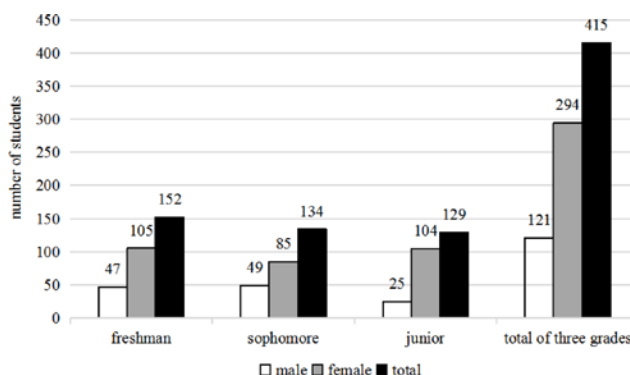


Figure 1: The compositions of the 415 participants.

the differences were significant when the most popular option of a question were same between female and male or in different years. We attached signs (\*, +, or # means significant differences between different group which is clarified in Tables 2 and 6) to the upper-right corner of such option when there were significant differences. We accepted values under 0.05 as significant.

## RESULTS

The findings obtained were a combination of universal and particular trends. A large proportion of all students (65.78%) hoped that the tutor would adopt the role of friend. Many participant's (31.57%) wanted a tutor who treated all students equally. Among all three years, the majority of students (60.00%) desired academic competence in a tutor rather than age or degree. Most participant's (59.76%) believed face-to-face communication to be the most effective mode with the tutors. By contrast, male freshman students preferred communication by Telephone or E-mail. Among 71.33% of all participants, a tutor having two to five students was the most popular response; 11.57% of all participants preferred one and even 3.61% preferred over 10.

The results of our statistical analysis of the survey results with respect to gender and university year appear in Tables 2-6. Regarding their own shortcomings, many participants (36.24%) identified weak initiative as their first choice. That initiative among male students was evidently much stronger than among females. The proportion of male students (35.54%) who never made the initiative to contact their tutors was much lower than with female students (62.59%,  $p < 0.01$ ). As to how they wanted the tutor to guide them, male students of college (31.40%) preferred irregular group appointment, whereas female students (36.39%) tended to choose regular group appointment. Male students hoped to obtain tutorial help in guidance on scientific

**Table 1: Questionnaire items (only one choice permissible for each question).**

	Item	Possible responses
Q1	Your year:	A) Freshman; B) sophomore; C) junior; D) senior
Q2	Your gender:	A) Male; B) Female
Q3	If possible, your criterion for choosing a tutor would be:	A) academic degree; B) position; C) age; D) professional title or rank; E) personal charisma; F) academic ability
Q4	How often do you want to communicate with your tutor?	A) once a week; B) once a month; C) twice a semester; D) once a semester
Q5	How long do you want to communicate with your tutor each time?	A) 15 min; B) 30 min; C) 1 h; D) over 1 h
Q6	How do you want to communicate with your tutor?	A) Face-to-face; B) telephone; C) e-mail; D) Wechat
Q7	How do you want your tutor to guide you?	A) regular group appointment; B) irregular group appointment; C) wait for student contact ; D) irregular personal appointment
Q8	What kind of help would you like from your tutor?	A) course selection; B) learning methods; C) scientific research; D) interpersonal relationship; E) life difficulties; F) employment; G) postgraduate entrance examination; H) psychological problems; I) adapting to college life; J) determining the direction of development
Q9	What are the shortcomings of the students themselves?	A) weak initiative; B) knowing little about the tutor; C) no clear purpose and plan during the period at college; D) fear of difficulties, not positive; E) thinking little of tutorial system
Q10	What kind of tutor do you like?	A) treating students equally; B) respecting students' personality; C) contemporary thinking; D) caring for students; E) well dressed and tidy; F) good at admitting mistakes; G) communicating well; H) striving to improve self-cultivation
Q11	Did you ever take the initiative to contact your tutor?	A) yes; B) occasionally; C) often; D) never
Q12	How would you like to get along with your tutor?	A) intimate; B) harmonious; C) neutral; D) a little distant; E) poorly
Q13	How would you like to contact your tutor ?	A) contacting tutor myself; B) contacting by tutor; C) meeting at appointed time; D) indifferent
Q14	How do you hope the tutor's attitude towards you?	A) enthusiastic and persuasive; B) quite enthusiastic; C) neutral; D) cold
Q15	What kind of role do you want your tutor to play?	A) parental; B) consultant; C) friend; D) leader; E) psychological consultant
Q16	In daily life, how do you want your tutor to help you ?	A) adapting to college life; B) solving problems in life; C) solving economic difficulties; D) caring for my daily life
Q17	What kind of psychological guidance and help do you want from your tutor?	A) talk and communication; B) guidance on difficulties, pressures, and setbacks; C) guidance on interpersonal relationships; D) emotional guidance
Q18	How would you like tutors to be assigned?	A) by college; B) two-way choice mechanism; C) tutor chosen by students; D) tutor choosing students
Q19	During the 4 years, you hope to be supervised by:	A) the same teacher all the time; B) different tutors in the lower and higher years; C) different tutors every year
Q20	What role do you want the tutorial system to play?	A) more important role than now; B) not essential; C) more attention from schools and tutors; D) provide better tutors
Q21	How many students do you want a tutor to guide at a time?	A) 1; B) 2-5; C) 6-10; D) over 10

research and learning methods; female students desired “determining the direction of development” through the tutorial system. Male students preferred meeting the tutor at an appointed time, whereas female students wished to contact their tutors first. In terms of psychological guidance, 54.55% of male students chose “guidance on difficulties, pressures, and setbacks”; 40.82% of

female students preferred “talk and communication”. Regarding frequency of communication with the tutor, female students preferred once a week, whereas male students tended to choose once a month.

Similarly, students in different years also showed varying characteristics. Regarding communication time, for example, freshman (43.42%) and junior

Table 2: Statistics of Response to the Questions by All Freshman Students ( $n=152$ ).

Q/A	A	B	C	D	E	F	G	H	I	J
3	1.97%(3)	3.95%(6)	15.79%(24)	9.21%(14)	19.08%(29)	50.00%(76)**				
4	38.16%(58)	40.79%(62)	18.42%(28)	2.63%(4)						
5	7.89%(12)	37.50%(57)	43.42%(66)	11.18%(17)						
6	36.84%(56)**	21.05%(32)	23.68%(36)	18.42%(28)						
7	26.97%(41)	42.76%(65)	17.11%(26)	13.16%(20)						
8	5.26%(8)	17.11%(26)	25.66%(39)	2.63%(4)	2.63%(4)	1.32%(2)	0.66%(1)	11.18%(17)	0.00%(0)	33.55%(51)
9	27.63%(42)	25.66%(39)	35.53%(54)	4.61%(7)	6.58%(10)					
10	32.89%(50)*	21.05%(32)	28.95%(44)	1.97%(3)	0.66%(1)	0.66%(1)	9.21%(14)	4.61%(7)		
11	10.53%(16)	19.74%(30)	13.82%(21)	55.92%(85)						
12	12.50%(19)	53.29%(81)*	24.34%(37)	9.21%(14)	0.66%(1)					
13	25.00%(38)	21.05%(32)	42.11%(64)	11.84%(18)						
14	45.39%(69)*	38.82%(59)	14.47%(22)	1.32%(2)						
15	0.66%(1)	13.82%(21)	73.68%(112)**	9.87%(15)	1.97%(3)					
16	51.97%(79)**	34.21%(52)	11.18%(17)	2.63%(4)						
17	40.79%(62)	36.18%(55)	11.18%(17)	11.84%(18)						
18	5.26%(8)	80.92%(123)**	10.53%(16)	3.29%(5)						
19	30.92%(47)	63.82%(97)	5.26%(8)							
20	23.03%(35)	15.13%(23)	34.87%(53)	26.97%(41)						
21	5.92%(9)	60.53%(92)*	30.26%(46)	3.29%(5)						

(\*, at least  $p<0.05$  compared with the corresponding percentage of all sophomore students; \*\*, at least  $p<0.05$  compared with the corresponding percentage of all junior students).

Table 3: Statistics of Response to the Questions by All Sophomore Students ( $n=134$ ).

Q/A	A	B	C	D	E	F	G	H	I	J
3	5.22%(7)	1.49%(2)	1.49%(2)	2.24%(3)	21.64%(29)	67.91%(91)				
4	32.09%(43)	46.27%(62)	11.19%(15)	10.45%(14)						
5	18.66%(25)	44.03%(59)	19.40%(26)	17.91%(24)						
6	67.91%(91)	9.70%(13)	8.21%(11)	14.18%(19)						
7	28.36%(38)	26.87%(36)	14.93%(20)	29.85%(40)						
8	5.22%(7)	19.40%(26)	20.15%(27)	3.73%(5)	2.99%(4)	6.72%(9)	7.46%(10)	2.99%(4)	2.24%(3)	29.10%(39)
9	44.03%(59)	24.63%(33)	24.63%(33)	0.75%(1)	5.97%(8)	0.00%	0.00%	0.00%		
10	47.76%(64)	9.70%(13)	16.42%(22)	2.24%(3)	0.00%(0)	0.75%(1)	14.93%(20)	8.21%(11)		
11	10.45%(14)	33.58%(45)	4.48%(6)	51.49%(69)						
12	15.67%(21)	61.19%(82)	17.16%(23)	4.48%(6)	1.49%(2)	0.00%				
13	51.49%(69)	14.18%(19)	23.13%(31)	11.19%(15)						
14	50.75%(68)	40.30%(54)	8.21%(11)	0.75%(1)						
15	10.45%(9)	22.39%(30)	59.70%(80)	1.49%(2)	5.97%(8)					
16	64.18%(86)	27.61%(37)	4.48%(6)	3.73%(5)						
17	28.36%(38)	50.00%(67)	17.16%(23)	4.48%(6)						
18	12.69%(17)	68.66%(92)	14.18%(19)	4.48%(6)						
19	48.51%(65)	32.09%(43)	19.40%(26)							
20	63.43%(85)	2.99%(4)	17.91%(24)	15.67%(21)						
21	13.43%(18)	69.40%(93)	9.70%(13)	7.46%(10)						

Table 4: Statistics of Response to the Questions by All Junior Students (n=129).

Q/A	A	B	C	D	E	F	G	H	I	J
3	3.88%(5)	0.78%(1)	0.78%(1)	0.78%(1)	29.46%(38)	64.34%(83)				
4	34.11%(44)	36.43%(47)	23.26%(30)	6.20%(8)						
5	5.43%(7)	40.31%(52)	42.64%(55)	11.63%(15)						
6	76.74%(99)	6.20%(8)	0.78%(1)	16.28%(21)						
7	43.41%(56)	34.88%(45)	2.33%(3)	19.38%(25)						
8	3.10%(4)	7.75%(10)	24.03%(31)	0.00%(0)	0.00%(0)	7.75%(10)	17.83%(23)	1.55%(2)	1.55%(2)	36.43%(47)
9	34.11%(44)	19.38%(25)	24.03%(31)	0.78%(1)	21.71%(28)	0.00%(0)	0.00%(0)	0.00%(0)	0.00%(0)	
10	10.08%(13)	13.18%(17)	25.58%(33)	4.65%(6)	2.33%(3)	0.00%(0)	34.88%(45)	9.30%(12)		
11	14.73%(19)	26.36%(34)	2.33%(3)	56.59%(73)						
12	20.16%(26)	68.99%(89)	6.20%(8)	3.88%(5)	0.78%(1)					
13	44.19%(57)	5.43%(7)	42.64%(55)	7.75%(10)						
14	61.24%(79)	24.81%(32)	13.95%(18)	0.00%(0)						
15	6.20%(8)	24.03%(31)	62.79%(81)	0.78%(1)	6.20%(8)					
16	68.99%(89)	24.81%(32)	0.78%(1)	5.43%(7)						
17	34.11%(44)	48.06%(62)	17.83%(23)	0.00%(0)						
18	20.16%(26)	70.54%(91)	7.75%(10)	1.55%(2)						
19	58.14%(75)	37.21%(48)	4.65%(6)							
20	47.29%(61)	2.33%(3)	38.76%(50)	11.63%(15)						
21	12.40%(16)	86.05%(111)	1.55%(2)	0.00%(0)						

Table 5: Statistics of Response to the Questions by All Female Students (n=294).

Q/A	A	B	C	D	E	F	G	H	I	J
3	4.08%(12)	4.08%(12)	2.38%(7)	1.70%(5)	21.09%(62)	66.67%(196)				
4	42.18%(124)	39.46%(116)	14.63%(43)	3.74%(11)						
5	9.52%(28)	42.18%(124)	38.78%(114)	9.52%(28)						
6	65.99%(194)	7.82%(23)	8.16%(24)	18.03%(53)						
7	36.39%(107)	34.35%(101)	6.80%(20)	22.45%(66)						
8	3.74%(11)	11.90%(35)	19.39%(57)	2.38%(7)	1.70%(5)	5.78%(17)	10.20%(30)	1.36%(4)	0.68%(2)	42.86%(126)
9	35.03%(103)	19.73%(58)	31.29%(92)	1.02%(3)	12.93%(38)	0.00%(0)	0.00%(0)	0.00%(0)	0.00%(0)	
10	27.55%(81)	13.61%(40)	25.17%(74)	3.06%(9)	1.02%(3)	0.34%(1)	20.41%(60)	8.84%(26)		
11	11.56%(34)	23.47%(69)	2.38%(7)	62.59%(184)						
12	17.01%(50)	65.31%(192)	12.93%(38)	4.42%(13)	0.34%(1)					
13	40.48%(119)	10.20%(30)	39.46%(116)	9.86%(29)						
14	52.04%(153)	37.07%(109)	9.86%(29)	1.02%(3)						
15	6.46%(19)	22.79%(67)	67.01%(197)	1.02%(3)	2.72%(8)					
16	66.33%(195)	26.53%(78)	2.72%(8)	4.42%(13)						
17	40.82%(120)	40.14%(118)	16.33%(48)	2.72%(8)						
18	12.24%(36)	75.85%(223)	8.84%(26)	3.06%(9)						
19	46.94%(138)	47.28%(139)	5.78%(17)							
20	41.50%(122)	2.04%(6)	38.44%(113)	18.03%(53)						
21	10.20%(30)	72.11%(212)	13.61%(40)	4.08%(12)						



Table 6: Statistics of Response to the Questions by all Male Students (n=121).

Q/A	A	B	C	D	E	F	G	H	I	J
3	3.31%(4)	4.96%(6)	17.36%(21)	13.22%(16)	18.18%(22)	42.98%(52) <sup>#</sup>				
4	21.49%(26)	45.45%(55)	22.31%(27)	10.74%(13)						
5	14.05%(17)	37.19%(45)	28.10%(34)	20.66%(25)						
6	42.98%(52) <sup>#</sup>	20.66%(25)	18.18%(22)	18.18%(22)						
7	26.45%(32)	31.40%(38)	19.01%(23)	23.14%(28)						
8	6.61%(8)	14.05%(17)	31.40%(38)	5.79%(7)	0.83%(1)	3.31%(4)	6.61%(8)	13.22%(16)	1.65%(2)	16.53%(20)
9	38.02%(46)	26.45%(32)	22.31%(27)	5.79%(7)	7.44%(9)	0.00%(0)	0.00%(0)	0.00%(0)	0.00%(0)	
10	42.15%(51) <sup>#</sup>	17.36%(21)	17.36%(21)	2.48%(3)	0.83%(1)	0.83%(1)	15.70%(19)	3.31%(4)		
11	12.40%(15)	33.06%(40)	19.01%(23)	35.54%(43) <sup>#</sup>						
12	12.40%(15)	52.89%(64) <sup>#</sup>	21.49%(26)	10.74%(13)	2.48%(3)	0.00%(0)				
13	37.19%(45)	23.14%(28)	28.10%(34)	11.57%(14)						
14	45.45%(55)	31.40%(38)	23.14%(28)	0.00%(0)						
15	3.31%(4)	13.22%(16)	61.98%(75)	12.40%(15)	9.09%(11)					
16	48.76%(59) <sup>#</sup>	35.54%(43)	13.22%(16)	2.48%(3)						
17	19.83%(24)	54.55%(66)	12.40%(15)	13.22%(16)						
18	12.40%(15)	68.60%(83)	15.70%(19)	3.31%(4)						
19	42.15%(51)	40.50%(49)	17.36%(21)							
20	49.59%(60)	18.18%(22)	14.05%(17)	18.18%(22)						
21	14.88%(18)	65.29%(79)	17.36%(21)	2.48%(3)						

(<sup>#</sup>, at least  $p < 0.05$  compared with the corresponding percentage of all female students).

students (42.64%) preferred 1 h; whereas 30 min was popular among sophomore (44.03%) students. Among the 21 questions, except for the first and second ones concerning gender and university year, for questions 5, 7, 13, 17, 19, and 20, the choices with the highest proportion of students were completely or partially different with the three years; By contrast, for questions 3, 4, 6, 8-12, 14-16, 18, and 21, the choices with the highest proportion of participants were the same for the three grades (Tables 2-4).

It is notable that when the choices with the highest proportion of students were the same, in some items, there were significant differences between male and female students as well as with university years. Regarding tutorial help in daily life, both male and female tended to choose “adapting to college life”; however, 48.76% of male students and 66.33% of female students showed significant differences ( $p < 0.01$ ). Thus, we observed differences according to gender, university year, and at the individual level.

## DISCUSSION

At present, the school of pharmacy of the University assigns tutors at the beginning of the students' first year, and each tutor is annually assigned three to six students. It appears that implementation of the tutorial system is effective there.

We found that in the survey, almost all response options of all questions were selected by some students. As well as noting the most preferred options, it is necessary to pay special attention to other options which could change with time or with environmental changes. Tutors should guide students according to student's talents and preferences, and tutors should analyze and address specific student problems. For example, If there are some students who are uncertain about their purpose in college, the tutor should provide good psychological guidance. Our results identified many clear differences among the university years, between males and females, and also among individuals. Achievements and problems with the tutorial system have been found to differ in different schools, different periods, and in different countries.<sup>16,17</sup> Each student is unique, and they may be influenced by, for example, environmental and psychological conditions as well as initiative. However, at present, only limited measures can be taken passively. It is necessary to consider ways of addressing this situation. Many aspects of the existing tutorial system in China should be improved to accommodate the differences identified in this paper. What is need is a finely adjusted tutorial system, which we term the “precision tutorial system”: that could accommodate

universal and particular characteristics. It is akin to precision medicine, which aims to determine individual differences in genetic and environmental factors as well as lifestyle; in that way, patients can be categorized and treated for maximum accuracy.<sup>18,19</sup>

Just as with precision medicine, only by grasping students' similarities and differences, and by teaching them according to their aptitudes and ideas and increasing communication (such as with questionnaire surveys) can the tutorial system play a better development role. That is the core of the precision tutorial system. To meet the requirements of this system, tutors have to improve their own scientific research ability, psychological counseling ability, and sense of responsibility. The precision tutorial system also needs attention, guidance and strong support, such as increasing investment from the school and even the whole of society. The precision tutorial system should combine standardization and individualization and be able to clearly distinguish one student from another. It should facilitate more precise, accurate guidance for students according to their individual differences, histories, characteristics, and needs.

It is necessary to introduce and properly implement the precision tutorial system. What is required is all-round reform, which should include such areas as perfecting incentive and supervisory mechanisms and promoting better design of the school system. In that way, the new tutorial system could serve the students better and brings greater social benefits. At the same time, it will be necessary to give full consideration to personal privacy.

## CONCLUSION

It is necessary to introduce and properly implement the precision tutorial system. That should combine standardization and individualization; it should be able to clearly distinguish one student from another; it should facilitate more precise, accurate guidance for students according to their individual differences, histories, characteristics, and needs. The new system could serve students better and produce greater social benefits. At the same time, it will be necessary to give full consideration to personal privacy.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.

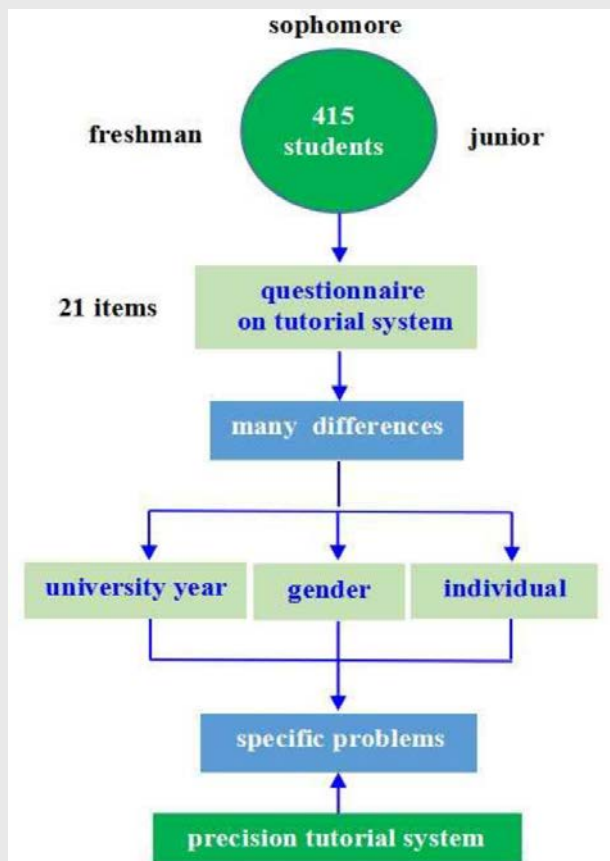
## ABBREVIATIONS

**H:** Hour; **Min:** Minute.

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## PICTORIAL ABSTRACT



## SUMMARY

We designed a 21-item questionnaire, which was administered to freshman, sophomore and junior students taking a pharmacy undergraduate degree, to analyze the current situation of with the undergraduate tutorial system. In all, 415 pharmacy students completed the questionnaire. We collected the data and categorized them into 12 groups and subjected the data to statistical analysis. We identified the common and different points between female or male students and by university year. There were considerable differences with respect to university year, genders and individuals. Even when the most popular options were the same, there were differences in the proportions between female and male students as well as among students in different years. Regarding the tutorial system, students need help in different ways. We present the notion of the “Precision tutorial system”, whereby tutors should guide students according to the students’ talents and preference as well as analyze and solve their specific problems. We believe it is imperative to introduce such a system.

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