

An Educational Information System to Follow Up on the Perceived IT Skills of Pre-Service Teachers, Global Distributions, Year 1

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Abstract

This article presents the preliminary results of a research project aiming at following up on the perceived IT skills of pre-service teachers of the faculty of pedagogy of Dalat University in Vietnam. It focuses on the description of the global distributions according to 8 main criteria (gender, program, progression in the program, use of computers at home, IT courses followed before and during their higher studies, perceived basic IT skills, perceived advanced IT skills, and the communication means used with teachers and fellows). These distributions helped in making comparisons between 273 participants of the newly opened primary program and 109 participants of the secondary programs operating for many years. These results provide an image of the situation at a given time, i.e., the fall session of 2021. The annual renewal of this type of survey will make it possible to describe its evolution over time.

Keywords: educational information system, IT skills, pre-service teachers, following up, survey results, perceived IT skills, global distributions

1. Introduction

This article presents the preliminary results of a research project (Bari, 2022) aiming at following up on the perceived IT skills of pre-service teachers. To achieve this goal, a digital tool has been set up to gather data about these skills. In order to use “different means allowing various kinds of analysis including several types of comparisons based on different criteria and variables. These means will allow us to undergo quantitative analysis, different kinds of queries, and eventually data mining in order to better understand current situations (i.e., snapshots at a particular point of time), as well as the evolution over an interval of time of several years”. This kind of work enters into the general trend to better understand the actual state of information and communication technologies (ICT or IT for short) of pre-service teachers and to provide them with adequate training since most parts of human activities are becoming more and more digitally oriented (Bresnahan & Yin, 2017) or (Alt & Raichel, 2018). Now, it became usual talk about digital literacy (Becker, 2018) even though the debate is ongoing (Buzzetto-Hollywood et al., 2018).

There are many studies regarding the self-perception of the IT skills of students in higher education levels (or their digital literacy). For instance, Peled (2021) conducted a study in which “the purpose of this study is to assess the level of digital literacies and digital readiness of students majoring in education” or the one described in (León-Pérez *et al.*, 2020) in which the objective “was to measure student self-perception about their own 21st-century digital skills related to the use of information and communication technologies (ICT) in Higher Education”. Another one had the purpose “to analyze the self-perception of future teachers of childhood education and primary education, and those studying for a master’s degree in secondary education teacher training on their Teacher Digital Competence (TDC), as well as the potential influence of gender, country and university institution of origin in their representations” (Ortega-Sánchez et al., 2020).

To undertake our study, a first survey was conducted during the fall term of 2021 with the students of the faculty of pedagogy of Dalat University in Vietnam. It is expected that the same survey will be conducted for 4 years in order to have a better understanding of the situation over time (Ritella et al., 2020).

This article presents the preliminary results of this survey for which 382 valid questionnaires have been received. The questionnaire comprises 5 sets of questions:

- 6 questions related to general information about the students (program to which they belong, progress in that program, gender, etc.),
- 7 questions related to the self-perception of their basic IT skills,
- 7 questions related to the self-perception of their advanced IT skills,
- 6 questions related to the way in which they communicate with their teachers and fellows,
- 3 questions related to the applications they most use, those they wish to learn to improve their learning and those they wish to learn to improve their teaching.

The global results for each of the 4 first sets of questions will be presented in turn (the last set of questions will be discussed in an upcoming article).

This article is organized as follows: after the introduction, section 2 explores the distribution according to gender; section 3 presents the distribution according to the programs of participants; section 4 presents the distribution according to the progression of students in their programs; section 5 is dedicated to the distribution according to the use of computers at home; section 6 describes the distribution according to IT courses followed before and during their higher studies; section 7 describes the distribution according to perceived basic IT skills; section 8 describes the distribution according to perceived advanced IT skills; section 9 presents the distribution according to communication means with teachers and fellows; and section 10 is dedicated to the conclusion of our study.

2. Distribution according to gender

At the time the form was delivered to all the students the Faculty of Pedagogy, there were 816 students (143 males and 673 females). In the sample of 382 students (there were 355 females, 25 males, and 2 who didn't mention their gender. Table 1 shows this distribution.

Table 1. Distribution according to gender

	Responses from Primary	Responses from Secondary	Total	Registered primary students	Response rates primary	Registered secondary students	Response rates secondary	Total registered students	Response rates
Female	271	84	355	370	73.24%	303	27.72%	673	52.75%
Male	2	23	25	9	22.22%	134	17.16%	143	17.48%
Total	273	107	380	379	72.03%	437	24.49%	816	46.57%

The total distribution shows that 7% of responding students are males but there is a significant difference between the secondary programs (27.4% of male students) and primary program (only 0.7% of male students).

Assuming that the distribution according to gender of pre-service teachers somewhat resembles that of in-service teachers, it may be interesting to see what is happening in other countries. For instance, in the 38 countries of the OECD, in the primary, there are 82.5% of females on average whereas, in the secondary, this average is 63.2%. Russia, with 99.1% of female teachers in primary presents the closest percentage to our sample. All these statistics can be found in OECD (2022) (Note 1).

3. Distribution According to the Programs of Participants

Table 2 shows the distribution according to the programs of participants in the survey. The primary program is a newly created program since it has only 2 years whereas the secondary programs exist for decades. Despite the youth of the primary program, it has been a great success with new students so far. Figure 1 shows the relative distribution based on percentages.

The Primary education teacher program is the newly created program 2 years before the time that the survey is conducted. However, this program is for those who want to be teaching kids from 6 to 11 years old (grades 1 to 5). Others are for those who want to be senior high school teachers teaching teenagers from 16 to 18 years old (grades 10 to 12). Although Dalat University does not have any program for grades 6 to 9, the students graduating from “secondary programs” could apply for a job in a junior high school. However, when running the secondary programs, the Faculty of Pedagogy does not focus on empowering students so that they could fulfill the tasks of junior high school teachers.

Table 2. Distribution according to the programs of the participants

Programs	Number of participants	Number of students in the program	% of participants within each program	% of participants according to their program	% of participants within the secondary	
Primary	273	379	72%	71%		
Secondary						
Biology	4	4	100%	1%	4%	
Chemistry	19	49	39%	5%	17%	
English	32	200	16%	8%	29%	
History	2	17	12%	1%	2%	
Literature	23	52	44%	6%	21%	
Math	23	109	21%	6%	21%	
Physics	6	6	100%	2%	6%	
Total	secondary	109	437	25%	29%	100%
Total		382	816	46.81%	100%	

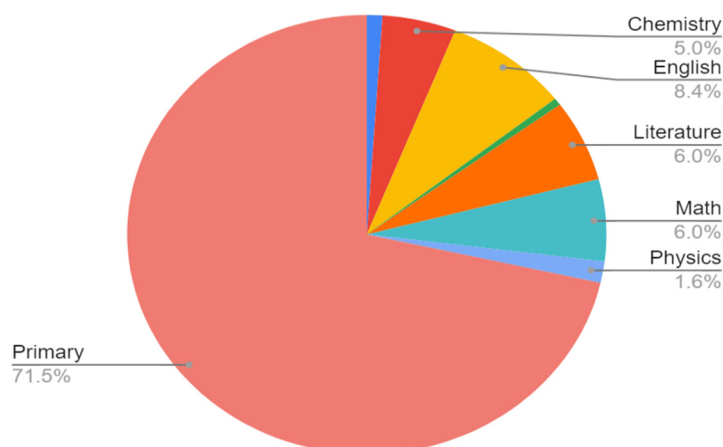


Figure 1. Distribution according to the programs of participants (%)

It is interesting to note that 3/4 of students in the primary program responded to the survey, whereas this is only the case for under one in two students in the secondary programs. Surprisingly, the response percentage is mostly inversely proportional to the number of students in the secondary programs. This is particularly the case for students in the English (16% of the 209 students) and Math (21% of the 109 students) programs whereas 100% of the students of the biology and physics programs participated in the survey (respectively 4 and 6 students). The numbers show that although only 16% of students in the English program participated in the survey, they represent 29% of the total secondary students.

4. Distribution according to the progression of students in their programs

Table 3 shows the distribution according to the progression of students in their programs, i.e., the year within their program. The most advanced students were clearly less interested in participating in the survey. We are wondering if this will still be the case in the forthcoming surveys or if it is due to the relative weight of the primary program students.

Table 3. Distribution according to the progression of the students in their programs

Year in the program	Number of participants	%
Year 1	143	37.4%
Year 2	183	47.9%
Year 3	31	8.1%
Year 4	25	6.5%
Total	382	100%

5. Distribution According to the Use of Computers at Home

Table 4 shows the distribution according to the use of computers at home. It shows that 3/4 of the students use computers at home. Almost all the students in the secondary programs use computers at home (95%) whereas this is only the case for 2/3 of students in the primary program. This situation may be explained by the fact the primary program is only open for two years whereas the secondary programs are open for over 15 years. This means that the more the students are advanced in their program, the more they use computers at home.

Table 5 gives a coherent explanation of the aforementioned situation because the students in the 1st and 2nd years are the ones who use fewer computers at home (respectively 73% and 70%). Knowing that all students of the primary program are in their 1st or 2nd year (this program opened for 2 years only), those numbers underline the situation. We may note that the total number of students who have responded to the question related to the use of computers at home is limited to 287 only.

Table 4. Use of computers at home by program

Program	N	%
Biology	4	100%
Chemistry	18	95%
English	31	97%
History	2	100%
Literature	21	91%
Math	22	96%
Physics	6	100%
Secondary	104	95%
Primary	183	67%
Total	287	75%

Table 5. Use of computers at home by year within their program

Year	N	%
Year 1	105	73%
Year 2	128	70%
Year 3	29	94%
Year 4	25	100%
Total	287	75%

6. Distribution According to IT courses followed before and during their higher studies

Table 6 shows the kind of IT course taken before the university. Over 90% of students had courses on the most commonly used applications (i.e., Word, Excel and PowerPoint) within which 30% learned other software applications. This situation makes it easier for the students to graduate since a basic IT certification is a required condition for graduation. Less than 8% didn't have any IT course in their high school.

Table 6. IT course followed before university

IT course	N	%
No IT course	30	7.85%
Word, Excel, and PowerPoint	230	60.21%
Word, Excel, PowerPoint, and software applications	117	30.63%
Prefer not to say	4	1.05%
Total	382	100%

Table 7 shows the kind of IT course taken by students in university. The basic informatics course comprises notions on the binary system, the structure of computers, etc. This course has been taken by 13% of the participants in the survey. This course is not offered at the Faculty of Pedagogy; thus students took it outside their faculty. The IT course in teaching and learning has been offered by the faculty during 2 terms to the students of the secondary programs and has been taken by 85 students. Most of the participants in the survey, especially those in the primary program, didn't have any course on IT (62%).

Table 7. IT course taken at the University

Course	N	%
Basic Informatics	50	13.16%
IT in teaching and learning	85	22.37%
No course	236	62.11%
Prefer not to say	9	2.37%
Total	380	100%

7. Distribution According to the Perceived Basic Skills

This section presents the results of the survey related to the perceived basic skills. These skill levels are listed in the first row of Table 8. The results for almost all the items follow Gauss' Normal Law. The item with the highest score is evidently the text processing since the students have been using this kind of application since high school. It is followed, for the same reasons, by the digital presentation applications (e.g., MS PowerPoint) and spreadsheet applications. The less mastered applications are those related to video and audio processing. Between the most and least mastered are the applications related to forms and image processing.

Table 8. Distribution according to basic skills

	Text processing	Spread-sheet	Digital Presentation	Forms	Image	Video	Audio
Very high	12	7	16	3	7	5	3
High	105	45	101	58	73	47	36
Average	242	267	232	233	226	207	204
Poor	19	56	26	51	52	81	92
Very poor	4	2	3	5	6	16	14
I don't know what it is	0	0	3	28	13	25	33
Number of responses	382	377	381	378	377	381	381

Figure 2 shows the distribution according to the perceived basic skills in percentages. It better

shows a kind of homogeneity in the results, which is, all in all, rather surprising since one would expect a greater disparity according to the types of application. This situation will be followed very closely during the next surveys.

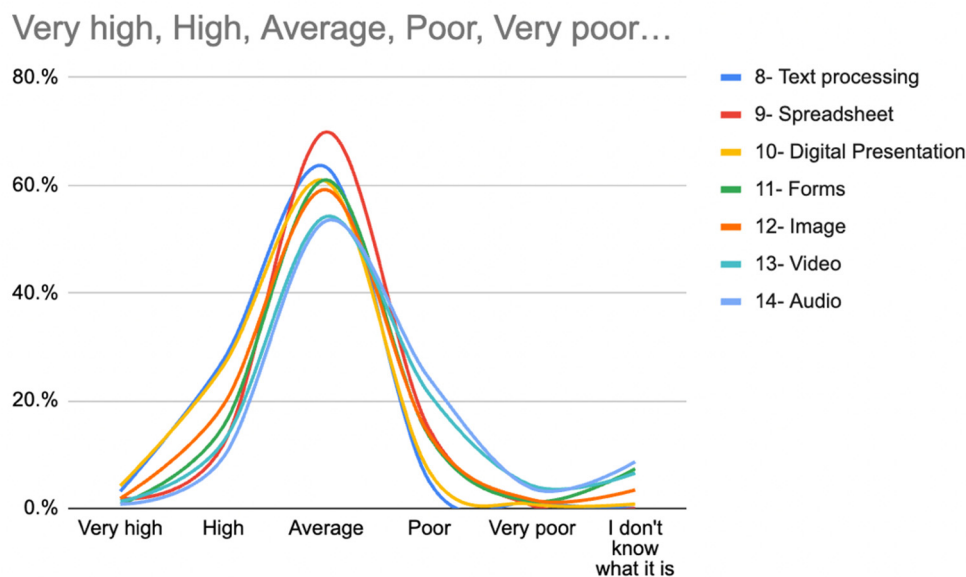


Figure 2. Distribution according to the basic skills in percentages

The next section describes the preliminary results related to the advanced skills of the students.

8. Distribution according to the perceived advanced skills

In this section we present the results for perceived advanced IT skills. These skills are related to the following items (see Table 9): *Interactive board*, *Advanced internet search*, *Websites building*, *Online interactive activities* (i.e., LearningApps (Note 2) (Susanti *et al.*, 2021), (Jansone & Sakadiņeca, 2016)), *Use of applications for learning*, and *Use of visual programming tools* (e.g., Scratch (Note 3) (Lamb and Johnson, 2011), (Resnink, M *et al.*, 2009), (Woodcock, 2019)). The last two items (*use of applications for learning* and *visual programming tools*), are not represented in Table 9 because only 3 students responded with the same value “Very poor”. As for the perceived basic skills, the results for all the items follow Gauss' Normal Law except that no item is over 60% (see Figure 3). It appears that the answer “I don't know what it is” is significantly higher than for basic skills, which is not surprising given the degree of penetration of advanced computing in schools.

Table 9. Distribution according to advanced skills

	Interactive board	Advanced internet search	Websites skills	Online interactive activities
Very high	1	13	3	3
High	47	99	26	51
Average	226	209	159	189
Poor	50	30	90	77
Very poor	6	6	6	6
I don't know what it is	48	26	83	50
Number of responses	378	383	367	376

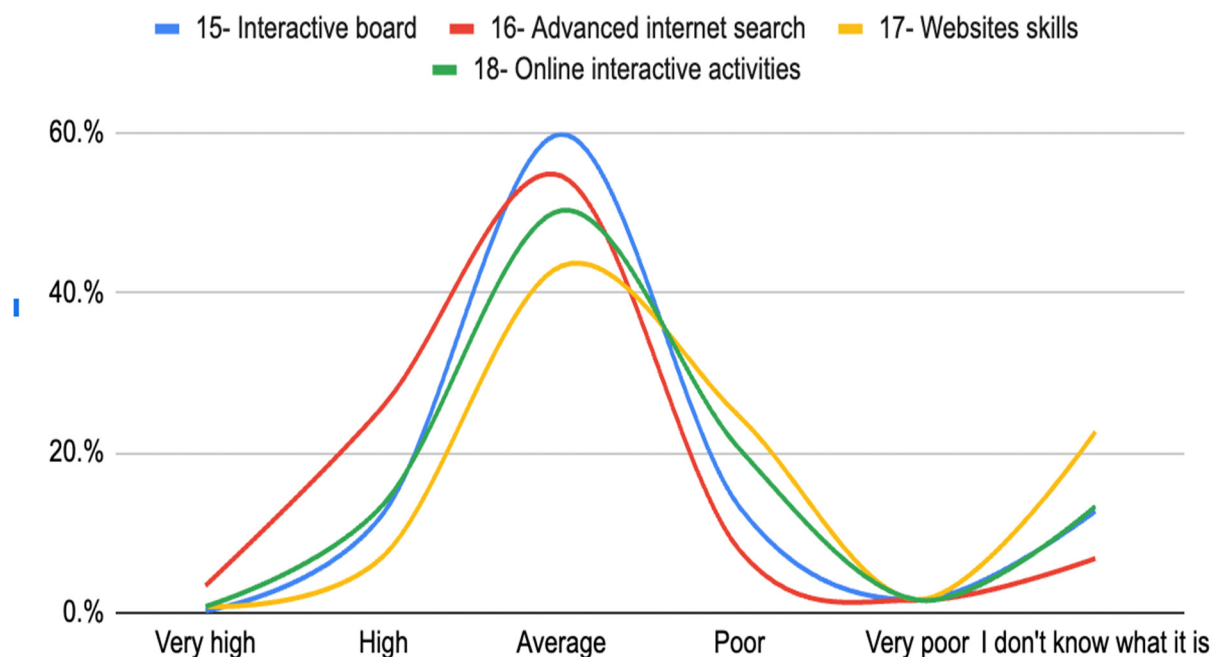


Figure 3. Distribution according to advanced skills in percentages

9. Distribution according to communication means with teachers and fellows

This section presents the means used to communicate with teachers and fellows (see Table 10). Almost all the students use email to communicate with their teachers but, surprisingly, at

the same time, a large proportion, 86%, use also Zalo (Thu Thi & Binh Thi, 2022). Zalo is a very popular social media in Vietnam (similar to Facebook and Messenger together and available on smartphones and personal computers). To communicate with their fellows, the situation is opposite to the one with their teachers: all the students (99%) use Zalo and a large number of them also use also email (75%). In the upcoming surveys, we will ask which purposes they use each of these communication means for.

The results show that a large proportion of the students (72%) use the cloud technology only to store their data (no responses for storing data **and** using online applications).

Table 10. Means used to communicate with teachers and fellows

	Email with teachers	Zalo with teachers	Email with fellows	Zalo with fellows	Use of Cloud technology
Nb of responses	381	381	382	382	298
Yes	369	326	285	379	214
Yes %	97%	86%	75%	99%	72%

10. Conclusion

We have presented the global distributions of the first-year survey dedicated to describing the perceived IT skills of pre-service teachers of the faculty of pedagogy of Dalat University in Vietnam. These distributions are related to the gender of the participants, their programs, their progression in their programs, and the use of computers at home. The results of this first survey give a snapshot of the situation related to the perceived IT skills by the students at a particular point in time (i.e., the fall 2021 semester). It helped in making comparisons between the 273 participants of the newly opened primary program (2 years) and the 109 participants of the secondary programs operating for many years. To better understand the evolution of this situation over time, and to help the school administration to take relevant actions to improve the IT skills of the students, a new survey will be conducted during the next year and a comparison will be done with the results of the present survey.

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Note 1. https://stats.oecd.org/Index.aspx?DataSetCode=EAG_PERS_SHARE_AGE#

Note 2. Free Platform: <https://learningapps.org/>

Note 3. Free Platform: <https://scratch.mit.edu/>

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