De La Salle University-Manila Laguna Campus

Readiness of DLSU Computer Science Students for Work

In Partial Fulfillment of the Course
ENGLRES

Submitted by

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Submitted to

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Chapter 1

Introduction

Background of the study

There is a stigma in the industry Computer Science (CS) graduates go into that a CS degree does not mean readiness for professional software development. The researchers would like to look into how this relates for the about-to and the graduates of La Salle's CS program, from technical skills and soft skills to the other extraneous factors that could be considered.

Significance of the study

The significance of the study is that the researchers could generalize (at least for the population of the respondents) whether La Salle's program for Computer Science is competent enough that generally La Salle graduates would not get tagged with the stigma (i.e. the graduates are actually ready for work).

Scope of the study

This study would like to prove or disprove that a DLSU CS student is ready for work, and for that the researchers will only be gathering data from about-to and graduates of La Salle's CS program. The researchers are limited to one school and one program only and nothing else.

Chapter 2

Methodology and Analysis of Data

Research setting

In this study, data were collected from the period of November 20, 2017 to November 30, 2017 from a total of 30 respondents (15 current students and 15 alumni). The survey was administered online through Google Forms and was taken by the respondents in their preferred venue and time within the period.

Participants

In this study, the participants were 15 Computer Science students in De La Salle University (DLSU) Taft campus or DLSU-Manila Laguna campus (formerly DLSU-Science & Technology Complex or DLSU-Canlubang), now collectively known as DLSU-Manila; and 15 Computer Science alumni who took up took up their Bachelors in Computer Science in DLSU-Manila.

For the students, the researchers have required the respondents to have already taken Web Application Development (WEBAPDE) to ensure that the respondents have passed at least three-quarters (¾) and therefore the majority of their programming subjects according to the course flowchart 2015-2019 for Computer Science provided by the College of Computer Studies of DLSU.

Instruments

The researchers designed two sets of questionnaires - one for the current students, the other for the alumni. The alumni set was designed to address the researchers' need to (1) get a consensus whether La Salle made their graduates feel job-ready; (2) test out correlations of whether practice of certain behaviors in one's college days would map out to valued characteristics/practices (Carter, 2013) in the workspace (e.g. the question pertaining to how comfortable the respondent was in consulting with

professors might prelude to the comfortability of the respondent with authority in general (managers, seniors, etc.)); and (3) have accounts on how working is as cases for basis.

The set for the current students on the other hand, are designed to (1) have an audit of what are practices that is common to most, if not all, Lasallians under Computer Science and (2) see if the answers of the current students would mirror the graduates' to some degree - consistency of turnout regarding La Salle's program on job-readiness.

The survey was carried out through Google Forms.

Procedure

The acquisition of respondents used the convenience sampling technique for both students and alumni, and was done online by means of the social platform service Facebook as well as personal network (especially for the alumni).

Then the students and alumni were given links to their appropriated survey questionnaire (https://goo.gl/forms/FTxDJTP9R1eLe8bs2 and https://goo.gl/forms/4nXYfcyuBtPWHjGi2 respectively) where they would be directed to the first section of the survey form - the letter to conduct a survey informed participants about what the study the survey they were about to partake in is; and assuring their answers would be kept confidential and would not be used to identify them.

The following section was for the profile of the respondents, proceeded by the last section which was the actual survey questions.

Upon reaching the target of 15 respondents for each set, the researchers then set the surveys to no longer accept answers.

Method of Analyses

The primary method of analysis is visual analysis or comparison (for cross-relation of some items) of survey turnout using the automatically generated reports by Google Forms and from there take the analysis deeper (is the turnout almost the same? If not, what caused the exception? What does this mean?)

For items that are non-polar questions, taking the mean of the results for some items gives the researchers an overview on what the item pertains to.

Analysis of data

Results of the Questionnaire for Students

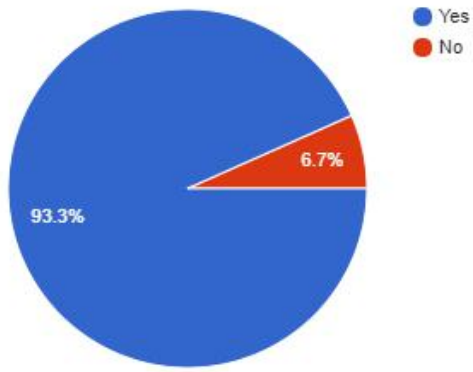

Figure 1. Do you do extra-curricular activity/s?

Figure 1. shows that 14 voted Yes (a little more than 93%) and 1 voted No (close to 7%) out of 15 on the question of whether they did any extracurricular activity/s. This can help link whether a student who engages in extra-curricular activities is more ready for work than one that does not in engage in any.

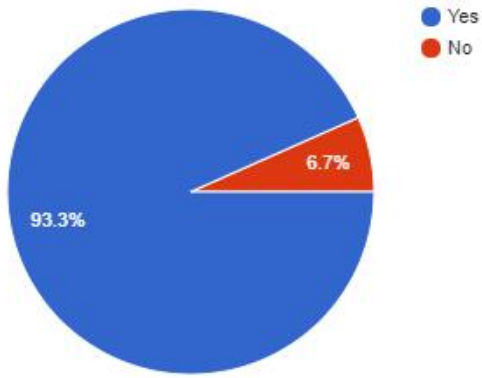

Figure 2. Are you able to work well with others?

Figure 2. shows that 14 voted Yes (a little more than 93%) and 1 voted No (close to 7%) out of 15 on the question of whether they worked well with others. This can help link whether a student who is able to engage well with others is more ready for work than one that does not in engage well.

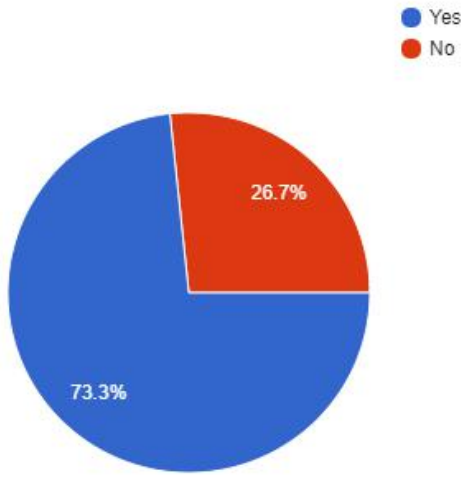

Figure 3. Do you make the effort to use and know good practice in coding?

Figure 3. shows that 11 voted Yes (a little more than 73%) and 4 voted No (close to 27%) out of 15 on the question of whether they efforted to use and know good practice in coding. This can help link whether a student who efforts to use and know good practice in coding is more ready for work than one that does not.

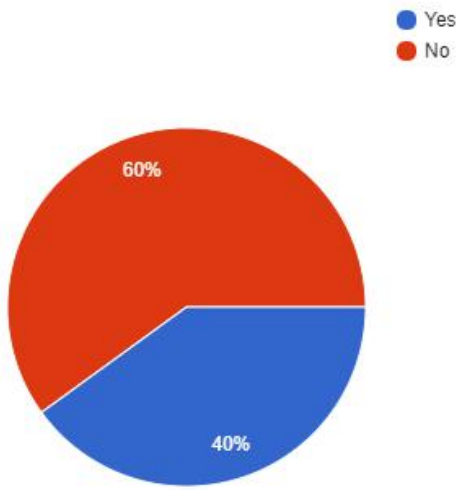

Figure 4. Do you work on other coding projects aside from the subject requirements?

Figure 4. shows that 9 voted No (60%) and 6 voted Yes (40%) out of 15 on the question of whether they worked on other coding projects aside from the subject requirements. This can help link whether a student who works on other coding projects that are not required by subjects is more ready for work than one that does not do any extra projects.

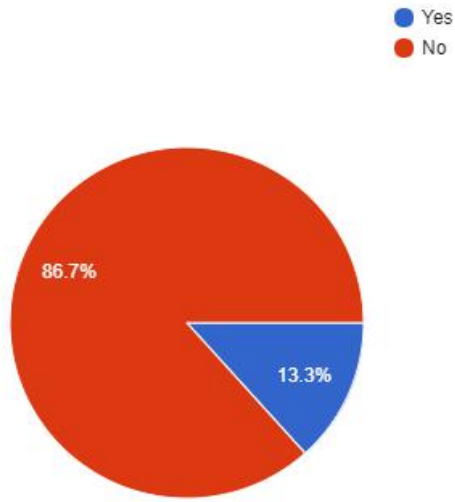

Figure 5. Do you believe you are ready for work?

Figure 5. shows that 13 voted No (close to 87%) and 2 voted Yes (a little more than 13%) out of 15 on the question of whether they believed they were ready for work. This expresses that several students feel that they are not ready for work.

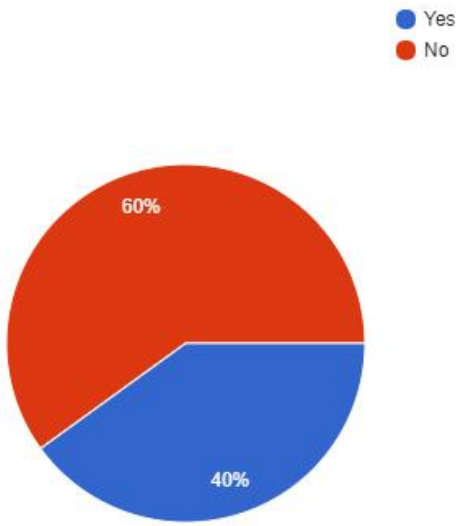

Figure 6. Do you think college prepares you enough for work?

Figure 6. shows that 9 voted No (60%) and 6 voted Yes (40%) out of 15 on the question of whether they believe college prepares them enough for work. This expresses that students feel that their college experience is lacking in preparing them for work.

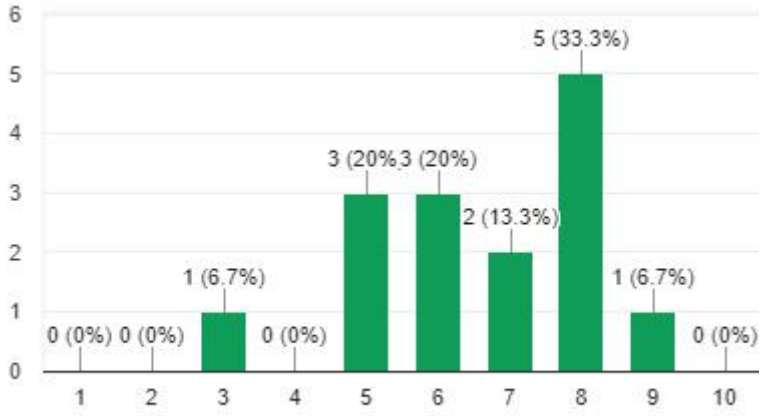

Figure 7. How confident are you with your skills in Java?

Figure 7. shows that Majority of the votes landed on the range of 5-8, expressing that students are fairly confident or have above average confidence in their skills in java. The students' votes averages at 6.6.

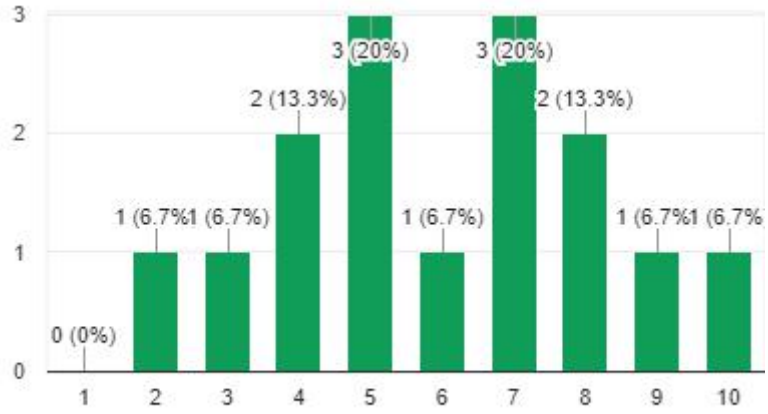

Figure 8. How confident are you with your skills in Web Development?

Figure 8. shows that An equal amount of the votes landed on the range of 5-7 against the summed up other ranges, expressing that many are fairly confident but there are some that feel less of more confident with their skills in web development. The students' votes averages at 6.

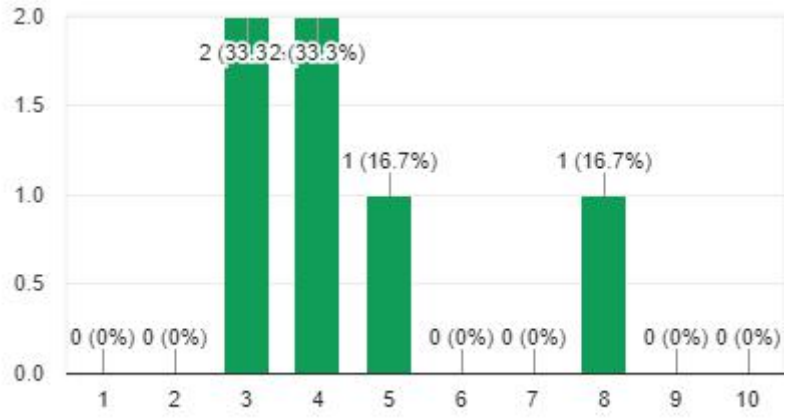

Figure 9. (If you are done with MOBAPDE) How confident are you with your skills in Mobile development?

Figure 9. shows that Majority of the votes landed on 3 and around it, expressing that most of the students have below average confidence in their skills in mobile development. The students' votes averages at 4.5.

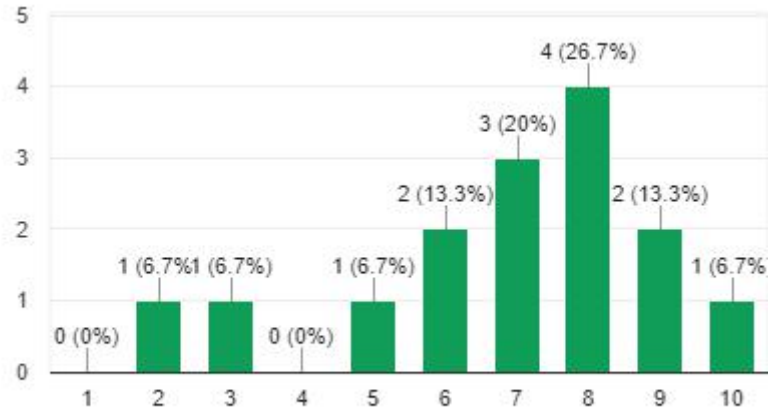

Figure 10. How good are you with self-learning?

Figure 10. shows that Majority of the votes landed on 8 and around it, expressing that most of the students have above average confidence in their capability to do self-learning. This may have to do with how the students taking up Computer Science are often tasked to learn something (be it a lesson topic or even an unfamiliar language) on their own because (1) learning something may need a higher degree of exposure than just classroom sessions; and (2) sometimes in-classroom learning is a commodity to the teachers in keeping up with the pace La Salle has set with its trimestral system. The students' votes averages at 6.8667.

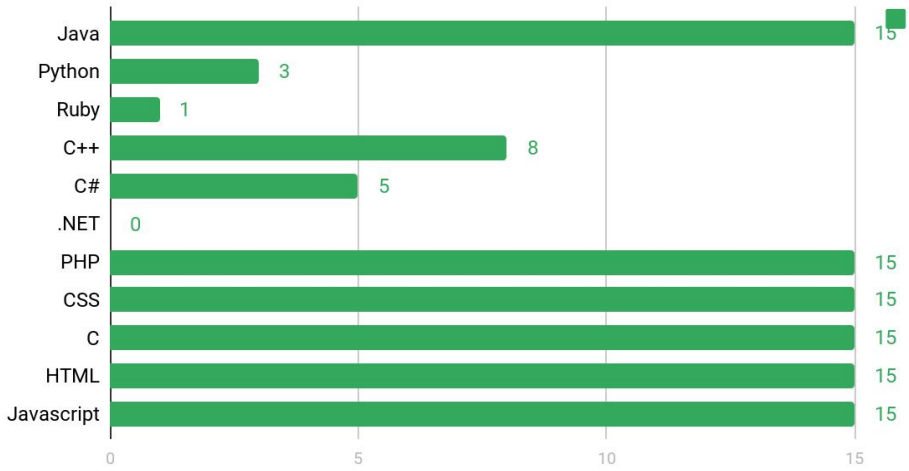

Figure 11. What programming languages have you worked with and are familiar in?

Figure 11. shows that Students are most familiar with Java, Web Stack (CSS, HTML, Javascript, and PHP) than the others. This reflects what programming languages are taught in the course; the minority voted on (Ru are the ones some students may have picked up on their own or were taught prior to or during college.

Python is a language that is brushed up on by some of the professors every now and then; the students encouraged to get a feel for it. Two of such course that Python gets brought up in are Statistics for Computer Science (CS-STAT) and Machine Learning (MACLERN) as Python, although originally a general purpose language, got dedicated library for data analysis and predictive modeling over the years with strong community support.

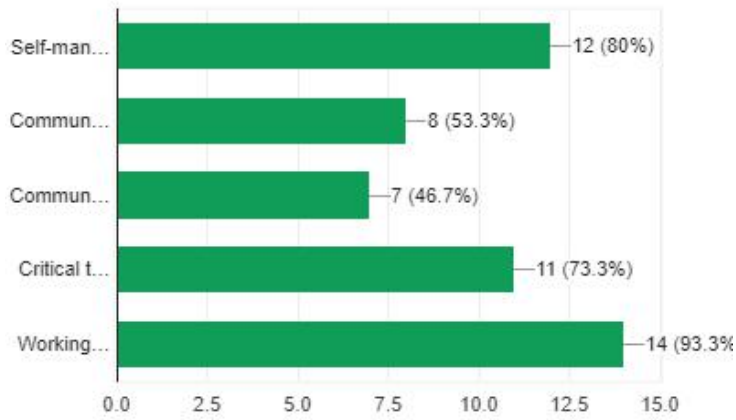

Figure 12. What soft skills do you think you need working on to be job-ready?

Figure 12. shows that Majority voted on working in teams (14), self-management (12) and critical thinking (11) are not that far behind either, this expresses that students feel they need more training on these things to feel that they are job-ready.

Results of the Questionnaire for Alumni

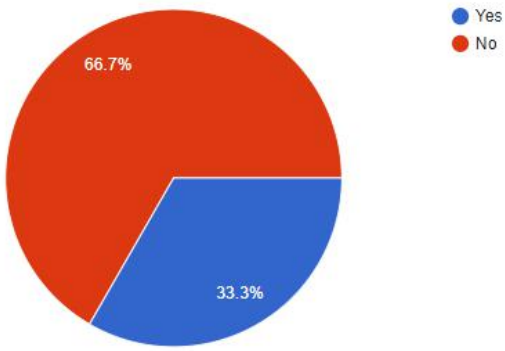

Figure 13. Did you believe you were ready for work after you graduated?

Figure 13. shows that 10 out of 15 (close to 67%) voted No, while the remaining 5 voted Yes (a little more than 33%). It is interesting to note that compared to the turnout of the same question asked to current students (Figure 5), less students believed they were not ready for work (a little less than 67% compared to the current students' ~87%).

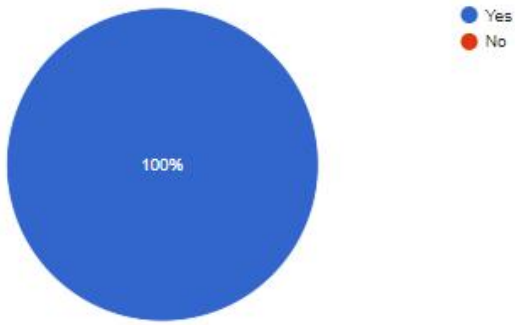

Figure 14. Are you able to work well with others?

Figure 14. Shows that all respondents (100%) answered yes. The turnout for the current students for the same question is almost the same having only 1 vote for No (Figure 2).

This may be attributed to how majority of the students (almost 94%) engage themselves in extra-curricular activities like clubs and school organizations wherein they get to work with other people for more than just a purely academic reason and they get to meet people outside their circles (Figure 1).

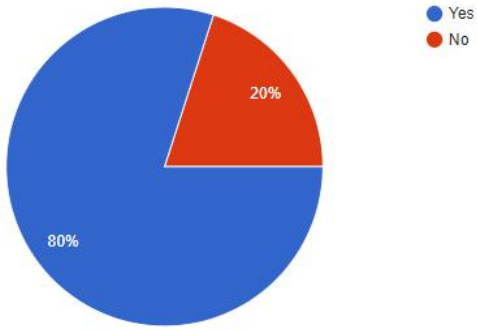

Figure 15. Were you comfortable in consulting with your professors?

Figure 15 shows that 12 out of 15 responded Yes to have been comfortable consulting with their professors before; while the remaining five answered negative.

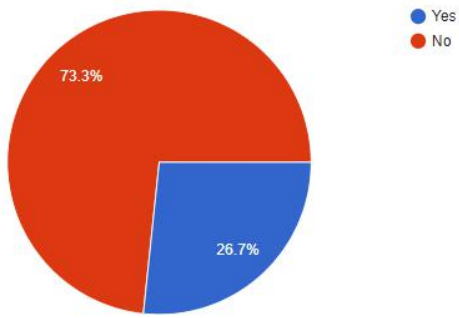

Figure 16. Did you work on other coding projects aside from the subject requirements back in college?

Figure 16 shows that 11 out of 15 Lasallian graduates responded No to have worked on coding projects outside of the subject requirements; while the remaining four responded Yes.

It is interesting to note that the current students take on more coding projects than the collective subpopulation the assortment the graduate respondents make did (40% of current students have worked on side projects; as compared to the graduates' ~27%).

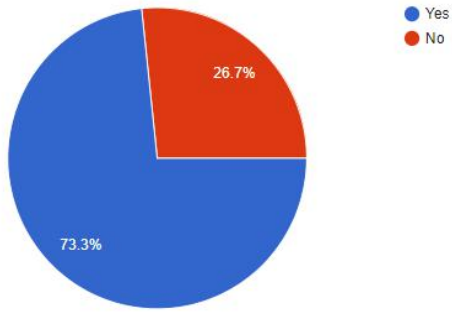

Figure 17. Are you using majority of what you have learned in college?

Figure 17. shows that 11 out of 15 Lasallian graduates responded Yes to using majority of what they learned in college; while the remaining four responded No.

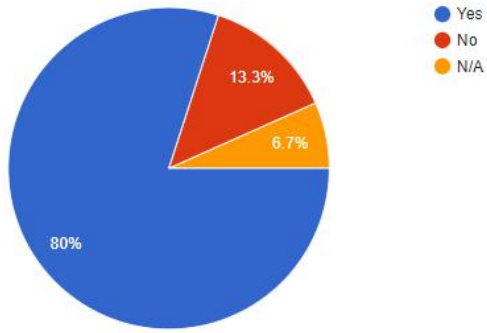

Figure 18. Did college prepare you well for work?

Figure 18. shows that 12 out of 15 Lasallian graduates responded Yes to whether college prepare them well for work, one responded Not Applicable, while the remaining two responded No.

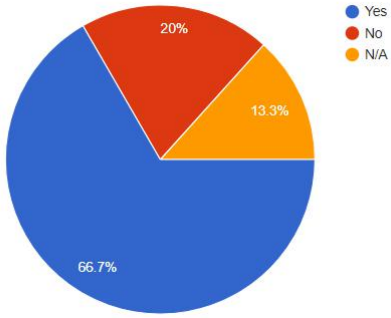

Figure 19. Are you comfortable in consulting with your manager (advise-seeking, negotiating for promotions, etc.)?

Carter (2013) have stated, comfortability in consulting with one's professors alludes to comfortability to consulting with seniors in a corporate setting for matters regarding career it shows in its similarity with the turnout for Figure 15 - a question regarding the graduates' comfortability in consulting with professors.

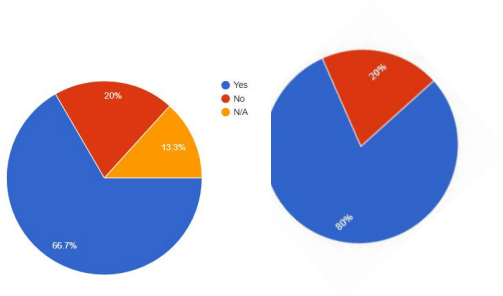

Figure 19.a. A side by side comparison of Figure 19 (left) and Figure 15 (right)

In Figure 19, one correspondent (making up a little over 13%), a graduate student on a Master's program, answered Not Applicable as he/she had not yet experienced having a manager in a company setting; while two answered No (20%) and the remaining 12 (close to 67%) said yes.

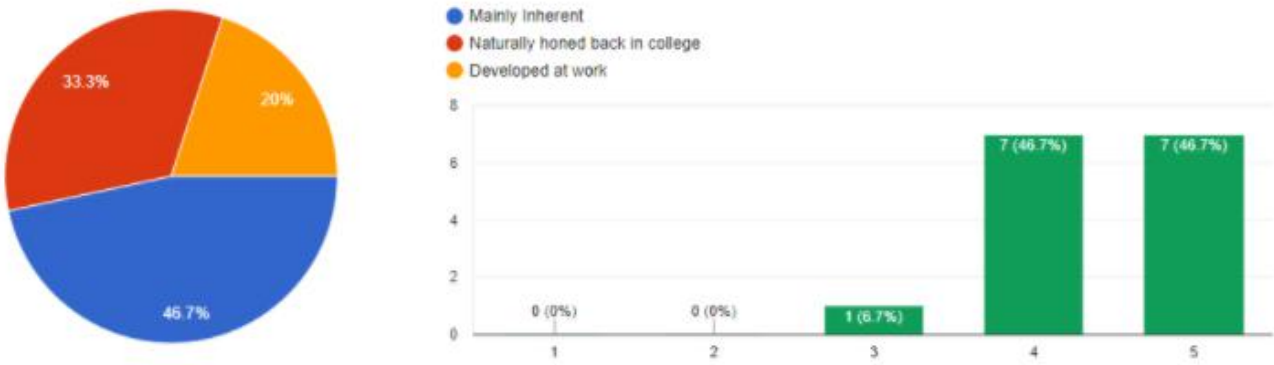

Figure 20. Self-management skills: Its importance and primary period of development

Figure 20 shows that majority of the alumni (~47%) found self-management skills to be mainly inherent; A little over 33% found it to be honed more in college; and the remaining 20% developing it mainly at work.

The overall tally of how they ranked self-management skills averages at 4.4 (with 1 as the lowest and 5 as the highest).

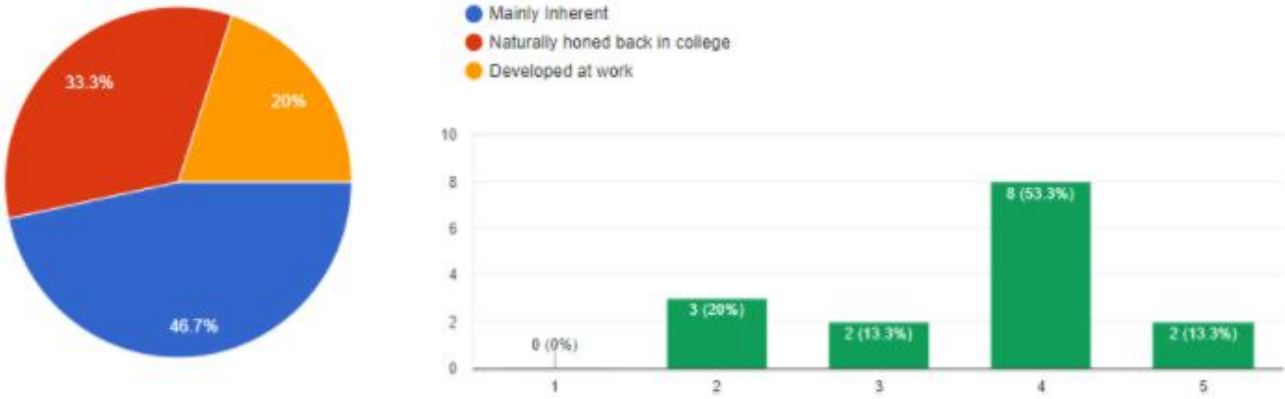

Figure 21. Communication skills with peers: Its importance and primary period of development

Figure 21 shows that majority of the alumni (~47%) found communication skills with peers to be mainly inherent; A little over 33% found it to be honed more in college; and the remaining 20% developing it mainly at work.

The overall tally of how they ranked communication skills with peers averages at 3.6 (with 1 as the lowest and 5 as the highest).

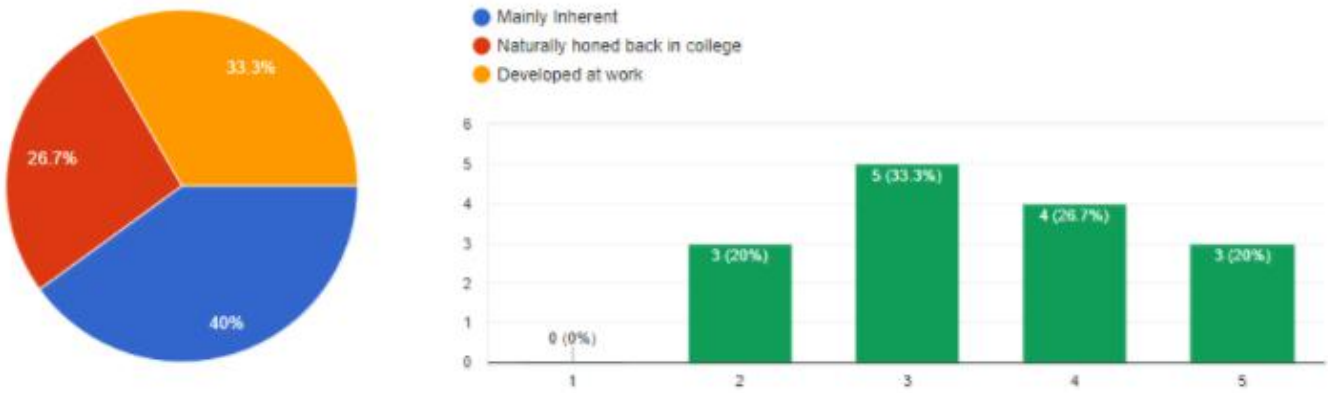

Figure 22. Communication skills with authorities: Its importance and primary period of development

Figure 22. shows that majority of the alumni (40%) found communication skills with authorities to be mainly inherent; A little over 33% found it to be more developed at work; and the remaining 20% honed it more in college.

The overall tally of how they ranked communication skills with authorities averages at 3.4667 (with 1 as the lowest and 5 as the highest).

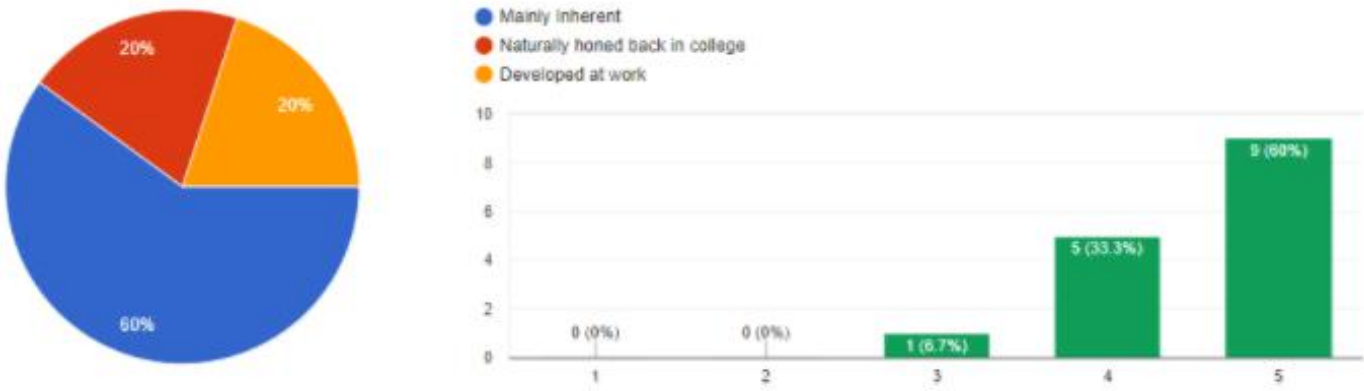

Figure 23. Critical thinking: Its importance and primary period of development

Figure 23. shows that majority of the alumni (60%) found critical thinking to be mainly inherent; 20% found it to be honed more in college; and the remaining 20% developing it mainly at work.

The overall tally of how they ranked critical thinking averages at 4.5333 (with 1 as the lowest and 5 as the highest).

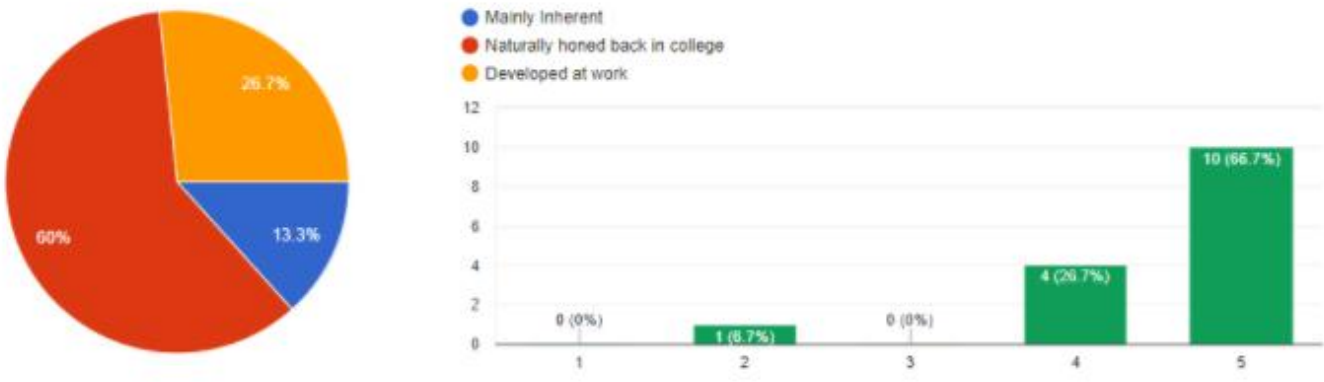

Figure 24. Working in teams: Its importance and primary period of development

Figure 24. shows that majority of the alumni (60%) found critical thinking to be naturally honed back in college; close to 27% found it to be more developed at work; and the remaining (a little over 13%) found it to be mainly inherent.

The overall tally of how they ranked critical thinking averages at 4.5333 (with 1 as the lowest and 5 as the highest).

According to the graduates, Critical thinking and the ability to work in teams ties (4.5333) for most important; followed by self-management skills (4.4), communication skills with peers (3.6), and communication skills with authority (3.4667).

Chapter 3

Summary, Conclusion and Recommendation

Summary

The overriding purpose of this study was to determine how the students of La Salle's Computer Science would fare on the characteristics valued by the workforce defined by Carter (2013) which are self-management skills, ability to communicate well with peers and authority, ability to work in teams, and critical-thinking.

The aforementioned characteristics are valued across all industries and professions. Taking into consideration that each industry does differ from each other, the researchers asked the alumni to rate how important each of them are and ranked them accordingly.

Critical thinking and the ability to work in teams tied (4.5333) for most important; followed by self-management skills (4.4), communication skills with peers (3.6), and communication skills with authority (3.4667).

The questionnaire items were plotted out to pertain to the five characteristics; to summarize the students' answers, refer to the figure below.

S - students' questionnaire ***A - alumni's questionnaire***

	SELF-MANAGEMENT		
S1	Extracurricular activities	Positive	Yes (97%)
S3	Good coding practice	Positive	Yes (74%)
	Averages to 85.5%		
	WORKING IN TEAMS		
S2	Works well with others	Positive	Yes (93%)
	CRITICAL THINKING		
S7	java skills	Positive	Above middle value (6.6)
S8	web development skills	Positive	Above middle value (6)
S9	mobile development skills	Negative	Below middle value (4.5)
S10	self-learning	Positive	Above middle value (6.9)
	Averages above middle value (6)		
	COMMUNICATION SKILLS WITH PEERS		
S2	Works well with others	Positive	Yes (93%)
	COMMUNICATION SKILLS WITH AUTHORITY		
A3	Comfortable in consulting with professors	Positive	Yes (80%)

Figure 25. Summary of students' responses with relation to the five characteristics

To shed light on how the items were matched, S1 and S3 slotted into Self-Management because both involve setting goals and managing time; S2 into Communication skills with peers and working in teams speaks for itself; S7-10 into Critical Thinking because all of them involves programming - which is basically problem-solving; and A3 into Communication skills with authority because professors are the managers in the academic setting - the transition of authority merely shifts in title, the comfortability in communication stays relatively the same (Carter, 2013).

The students' response says positive to all five, yet their answer in Figures 5 and 6 shows they do not believe they are ready nor did the school prepare them enough. Interestingly, the graduates also did not believe they were ready back then before their first job (Figure 13); however they did admit that college mostly prepared them enough for work (Figure 18).

While the students' generally tested positive; critical thinking tested low on the positive threshold at 60% (S7-10 had values 1 to 10; 6 out of 10 constitutes to 60%). However, critical thinking according to the graduates would not be attributed to being inherent rather than developed at school (Figure 23). The researchers think Figure 4 holds relation to this event.

Figure 4. says only 4 out of 10 (40%) dabble in side projects. Side projects means more programming. The continual use of abstract thinking in programming can guide and discipline one's approach to problems in a way that has value well beyond the information technology-programming setting - it instills critical thinking. Inherent here now means not necessarily inborn but more of ingrained

Of the three most answered characteristic of what Lasallians think they need work on, Critical thinking was the only one which showed subpar results for the positive threshold (60% compared to the 80% and 85.5% of working in teams and self-management skills respectively), Lasallians could work on it by simply working on more projects and showing more interest to Computer Science beyond the classroom.

Conclusion

Although majority of the students think they aren't ready for work; their stay at college in La Salle actually does prepare them enough for it.

Lasallians think they mostly need to improve more on working with self-management, working in a team and critical thinking. The first two, Lasallians tested out glowingly positive and does not seem to be in need of further concern. Critical thinking on the other hand, they could work on side projects to begin working on it.

Recommendation

It is recommended that the research be done again but with a larger sample population to garner a more definitive conclusion. For the school, it is recommended that they hold studies like this to garner more data to fine-tune their program and create more opportunities for the students to grow into. For the students, it is recommended that they take said opportunities to better themselves but also work on it beyond what the school provides.

Chapter 4

References

Are most of the required courses in an undergraduate computer science program useless for real world programmer job applicability? (n.d.). Retrieved September 21, 2017, from https://www.quora.com/Are-most-of-the-required-courses-in-an-undergraduate-computerscience-program-useless-for-real-world-programmer-job-applicability

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Chapter 5

Appendices

Appendix A: Letter of Consent

Dear Sir/Madame:

Animo La Salle!

There is a stigma in the industry Computer Science (CS) graduates go into; that a CS degree does not mean readiness for professional software development. The researchers would like to look into how this relates for the about-to and the graduates of La Salle's CS program, from technical skills and soft skills to the other extraneous factors that could be considered.

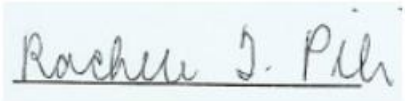
In relation to this, the researchers would like to conduct a survey that will give information that may prove or disprove that DLSU CS students are ready for work, and with this same information formulate an appropriate conclusion.

Rest assured that the identifying information you provide will be confidential. Your answers will only be used for academic purposes.

Yours in St. La Salle,

Borromeo, Klaudia Gaia L.
Saliot, Hannah Salome J.

Noted by:



Rachele T. Pili
Faculty
ENGLRES

Appendix B: Questionnaires

Questionnaire for Students

Profile of Respondents

Description (optional)

Name (optional):

Short answer text

Age: *

- 18 - 19
- 20 - 21
- 22 - 23
- 24 and over

Year/Level: *

Short answer text

Occupation: *

Short answer text

Contact detail (email/mobile#): *

Short answer text

If working, how many year/s:

- Less than 1
- 1 - 4
- 5 - 9
- 10 and over

Survey Questions

Description (optional)

Do you do extra-curricular activity/s ? *

- Yes
- No

Are you able to work well with others? *

- Yes
- No

Do you make the effort to use and know good practice in coding? *

- Yes
- No

Do you work on other coding projects aside from the subject requirements? *

- Yes
- No

Do you believe you are ready for work? *

- Yes
- No

Do you think college prepares you enough for work? *

- ◯ Yes
- ◯ No

How confident are you with your skills in Java? *

	1	2	3	4	5	6	7	8	9	10	
Lowest	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Highest

How confident are you with your skills in Web Development? *

	1	2	3	4	5	6	7	8	9	10	
Lowest	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Highest

(If you are done with MOBAPDE) How confident are you with your skills in Mobile development?

	1	2	3	4	5	6	7	8	9	10	
Lowest	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Highest

How good are you with self-learning? *

	1	2	3	4	5	6	7	8	9	10	
Lowest	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Highest

What programming languages have you worked with and are familiar in? *

- [ ] Java
- [ ] Python
- [ ] Ruby
- [ ] C++
- [ ] C#
- [ ] .NET
- [ ] Other...

What soft skills do you think you need working on to be job-ready? *

- [ ] Self-management skills
- [ ] Communication skills with peers
- [ ] Communication skills with authorities
- [ ] Critical thinking
- [ ] Working in teams
- [ ] Other...

Questionnaire for Alumni

Profile of Respondents

Description (optional)

Name (optional):

Short answer text

Age: *

- Less than 21
- 21 - 25
- 26 - 30
- 31 and over

Occupation: *

Short answer text

If working, how many year/s:

- Less than 1
- 1 - 4
- 5 - 9
- 10 and over

Survey Questions

Did you believe you were ready for work after you graduated? *

- Yes
- No

Are you able to work well with others? *

- Yes
- No

Were you comfortable in consulting with your professors? *

- Yes
- No

Did you work on other coding projects aside from the subject requirements back in college? *

- Yes
- No

Are you using majority of what you have learned in college? *

- Yes
- No

Did college prepare you well for work? *

- Yes
- No
- N/A

Are you comfortable in consulting with your manager (advise-seeking, negotiating for promotions, etc.)? *

- Yes
- No
- N/A

Importance of soft skills in the workplace

Determine whether the five following skills are mainly inherent, naturally honed during your stay in La Salle, or developed at work; then rank them in terms of importance in the workplace with 1 as the lowest and 5 as the highest

1. Self-management skills *

- Mainly Inherent
- Naturally honed back in college
- Developed at work

Rank *

	1	2	3	4	5	
Low	○	○	○	○	○	High

2. Communication skills with peers *

- ◯ Mainly Inherent
- ◯ Naturally honed back in college
- ◯ Developed at work

Rank *

	1	2	3	4	5	
Low	◯	◯	◯	◯	◯	High

3. Communication skills with authorities *

- ◯ Mainly Inherent
- ◯ Naturally honed back in college
- ◯ Developed at work

Rank *

	1	2	3	4	5	
Low	◯	◯	◯	◯	◯	High

4. Critical thinking *

- Mainly Inherent
- Naturally honed back in college
- Developed at work

Rank *

	1	2	3	4	5	
Low						High

5. Working in teams *

- Mainly Inherent
- Naturally honed back in college
- Developed at work

Rank *

	1	2	3	4	5	
Low						High

How different is the work environment from when you were in college? *

Long answer text