National Employability Study
IT/ITeS Sector
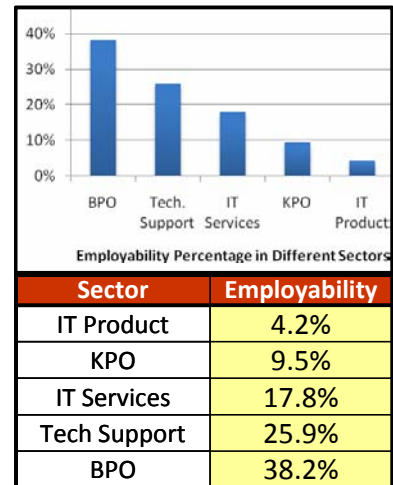
Aspiring Minds

Key findings and Intervention Indicators

Aspiring Minds has conducted India's first employability study of technical graduates based on the results of a standardized computer-based test called AMCAT conducted for more than 40,000 engineering and MCA students (in final year) across the country[1]. AMCAT was conducted in more than 12 states under proctored environment. AMCAT [1] covers all objective parameters for adjudging employability in the IT/ITeS sector including English Communication, Quantitative skills, problem-solving skills and Computer Science and Programming skills. Employability figures are based on actual hiring benchmarks on AMCAT scores set by multiple companies in IT/ITeS related sectors (for e.g., see [2]). Since the study is based on a standardized aptitude and skill test, not only does it find the employability quotient, but also helps investigate skills that are deficient in particular group of candidates with regard to different sectors.

The findings and inferences of the study are summarized as follows:

1. It is common to quote a blanket figure of 25% employability in the IT/ITeS sector. Such a figure is incomplete and not very useful, since the criteria for IT services, IT product, KPO (Knowledge Process Outsourcing), BPO and technical support sectors are very different. There is a need to study employability in these sectors individually.

    a. The current study has found that employability with regard to IT product companies is as low as 4.22 % (amongst computer/electronics related branches), whereas **employability with regard to IT services companies is 17.84%** (wherein the company gives 3-6 months of in-house training) which is lower than the advertised figure of 25%. To be at the forefront of innovation and achieve higher growth, it is necessary that higher-order work with regard to product development and research grows in India apart from the services industry. To facilitate the same, the product engineering employability needs to be improved from the current figure of 4.22%. This requires greater focus on part of institutions of higher education to impart quality education in Computer Science and Programming. (Refer Table 1)

Employability Percentage in Different Sectors

Sector	Employability
IT Product	4.2%
KPO	9.5%
IT Services	17.8%
Tech Support	25.9%
BPO	38.2%

Table 1:Employability of technical graduates

    b. **KPOs will find only 9.47% technical graduates employable.**

    c. Employability with regard to BPOs and Technical Support Jobs (TSJ) is 38.23% and 25.88% respectively. This leaves a total of 61.77% students who require training in both soft-skills and problem-solving skills to be eligible for any job in the IT or ITeS sector.

    d. We investigated how many candidates will be employable at IT services companies if they do not run 3-6 months in-house training and rather, put candidates directly on projects. This is a long term need of the industry and required for India to maintain its global edge in the IT services space. The figure can be optimistically estimated to 5.97%. This is a concerning figure. **For India to maintain its competitive advantage, the educational institutions need to produce *industry-ready* candidates.** This requires substantial intervention on part of higher education institutions to impart IT skills to students.

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[1] The sample was statistically balanced across various parameters to be representative of the true technical graduate population. A `carefully chosen stratified sample was used for the study.

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2. It is worthy to study whether employable students are equally distributed amongst campuses and if not, how large is the skew in distribution. Campuses which fall in the top 100 campus list (according to various credible surveys) were segregated and their employability was compared with the rest of the campuses (called tier 2 campuses in this study).

   a. The **employability for IT product companies fall by three times** from 10.07% to 3.47%, whereas the employability in IT services sector and KPO fall by almost two times (29.41% to 16.36% and 18.93% to 8.26% respectively). As expected, BPO and TSJ employability do not change much. (Refer Table 2)

IT/ITeS Industry Sector	Tier 1 Campus	Other Campuses
IT Services Company	29.4%	16.4%
IT Product Company	10.0%	3.5%
Knowledge Process Outsourcing	19.0%	8.3%
Business Process Outsourcing	44.7%	37.4%
Technical Support/Networking	36.8%	24.5%

Table 2: Employability percentage for Top 100 Campuses v/s Rest

   b. Given that the ratio of the number of top 100 campuses to the rest is more than 10 times, **we can conservatively estimate that more than 70%[2] employable students in IT product sector are in so-called tier 2 campuses**, whereas more than 80% employable students for the IT services/KPO sector are in tier 2 campuses. According to current trends IT product and KPO companies do not source from tier 2 campuses, which creates a large artificial dip in supply of eligible candidates.

   c. At the same time, **it is three times harder (in cost and effort) to identify an employable graduate from a tier 2 campus as compared to a tier 1 campus for a product company and twice as hard for IT services companies and KPOs**. From an economic perspective, this makes it unattractive and inefficient for companies to hire students other than those from tier 1 campuses. This is the reason why companies use the campus name as a proxy to decide whether to give candidates an interview chance or not. Innovative models and government support is required to help bridge this huge gap hampering equal job opportunity and requisite manpower supply.

Sector	Top 100 Campus Recruitment Cost	Other Campus Recruitment Cost
IT Product	x	3x
IT Services	x	2x

Sector	Top 100 Campus Employable Supply	Other Campus Employable Supply
IT Product	<30%	>70%
IT Services	<20%	>80%

Table 3: Cost v/s Supply analysis

   d. It is important to understand skills that are lacking in students of tier 2 campuses. Our study shows a gap of 20 percentile points in English Communication, Logical Ability and Computer Programming, whereas the gap in Quantitative ability is 27 percentile points. This clearly **shows that maximum effort is required to hone Math skills of students**, whereas consistent effort is needed in other areas as well.

   e. Interestingly, the gap in computer-programming skills is similar to the gap in English Communication skills and Aptitude. **This indicates that the top 100 campuses do not make much difference to the programming skills of a candidate,** given he/she had the same aptitude at the intake as compared to a tier 2 campus student. The difference in Programming ability is simply a function of the intake quality of students.

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[2] 3.47 times 10 is 34.7 students in tier 2 campuses as compared to 10.07 in tier 1 campuses. 34.7 is 77% of 44.77.

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3. Gender studies with regard to employability are a topic of much interest and debate. Interestingly, the current study shows that the difference in employability for female vs. male technical graduates is not more than 2 percentage points in any IT/ITeS sector**! Females and males are equivalently employable in the skilled industry**. On the other hand, the ratio of males to females in technical studies is 2:1. With unbiased hiring and similar aspiration level amongst both genders, the same ratio should be maintained in the IT/ITeS industry. The data presented in (Rajalakshmi, 2003 [3]), shows that female percentage in IT industry is 21%. This is much lower than the expected 33%. It may however be noted that the male-female ratio in technical studies was much lower earlier (2003) than it is today. To draw any further conclusion, the current ratio of males to females in the IT/ITeS sector needs to be studied.

    A study was also conducted to find how males compare to females with regard to specific skills. Our study showed that females performed better than males in English (by 2 percentile points, but significant) and Computer Programming (by 4 percentile points), whereas males did better in Logical Ability (by 2 percentile points) and Quantitative Ability (by 11 percentile points). Though these results show the same trends as observed globally, they need to be interpreted from a nuanced perspective given the debate on the bias of standardized testing scores with regard to gender.

4. We studied if there was a difference in employability and skills for colleges in tier 1 cities vs. tier 2 cities (classification based on population). For this study, the top 100 campuses were removed from both groups. These campuses are outliers and attract students from across the country. The colleges in both the sets were the average colleges.

    a. The employability for IT services companies fell from 19% to 13.8%, from 4.3% to 2.4% for IT product companies, whereas for KPOs, it went from 10.0% to 6.1%. **This shows that the fall in employability varies from 25% to 40% in these sectors**. One can see great potential in tier 2 cities for creating IT hubs, since they exhibit decent levels of employability.

Sector	Tier 1 Cities	Other Cities
IT Product	4.3%	2.4%
KPO	10.0%	6.1%
IT Services	19.0%	13.8%
Tech Support	27.6%	22.6%
BPO	40.7%	35.9%

Table 4:Employability in Tier 1 Cities v/s Other Cities

    b. Surprisingly, **the gap in employability in BPO and TSJ is not as much as generally perceived**. The BPO sector employability in tier 1 cities is 40.7%, whereas it is 35.9% in other cities. Similarly for TSJ sector, employability falls from 27.6% to 22.6%. This suggests that there are a good number of employable students in tier 2 cities for BPO and TSJ sector. Not only can students be sourced from these areas, there is benefit in establishing work locations in these areas and running operations at low cost with candidates as talented as those available in big cities. (Refer Table 4)

    c. We studied what skills create the employability gap. We expected that English would be the major factor for creating this skew. However, we found out that the difference in English, Quantitative and Computer Programming skills were all between six to eight percentile points, whereas Logical ability was slightly higher upto nine percentile points. This breaks the myth that the major gap for tier 2 cities is in English and Personality. **The gap is uniform across English, Aptitude and Computer Programming Skills**. This raises a question on the current advent of Personality-Development programs for technical graduates across the nation. The same seeks to fill the gap incompletely. (Refer Figure 1)
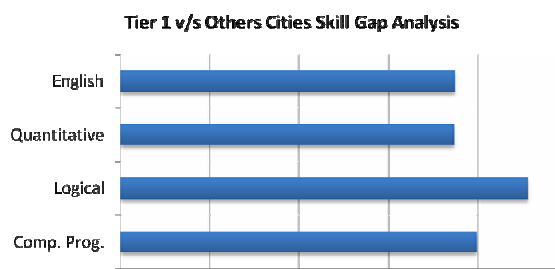
Fig.1: Skill Gap with regard to Tier of City

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5. Within technical graduates, the skew was compared across degrees, i.e. MCA and engineering graduates.

    a. The **employability of MCA students is almost half of that of engineering students** in case of IT services companies and KPOs. However, for IT Product companies, the employability of MCA students is not as skewed (4.2% as compared to 5.4%).

    b. With regard to skills, MCA students are better than engineering students (in computer/electronic/IT related branches) in Computer Programming by 12 percentile points, whereas engineers perform better in English, Logical and Quantitative Aptitude by 10 to 20 percentile points.

    c. MCA candidates have excellent potential for becoming employable at IT product companies, given their good computer programming skills. Intervention is required with regard to English and Quantitative Ability skills.
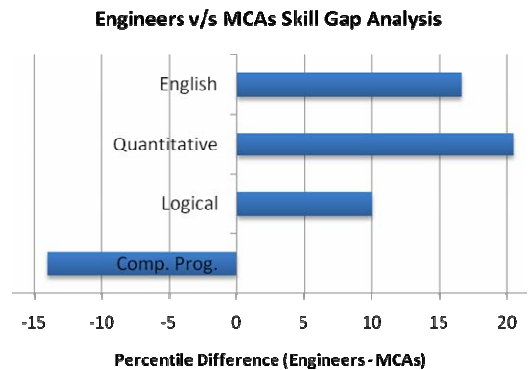

Fig.2: Engineer v/s MCA skill Gap

CONCLUSION

I. The current talent pool has very low employability (4.22%) with regard to IT product companies. As the IT industry in India matures, this shall become an impediment for growth due to lack of trained manpower for product based and research based projects. Taking a long term perspective for growth, strong intervention is needed to correct this.

II. To improve its competitive advantage, eventually the IT services industry would require industry-ready individuals and not those who have to be trained in-house by corporates before they could start working. The percentage of such people is just 5.97%. Intervention in terms of high quality training in IT skills by institutions of higher education is required.

III. A total of 62% candidates require training to be eligible for any job in the IT/ITeS sector.

IV. 70% of candidates employable to the IT products sector are from colleges other than the top 100 campuses, whereas the proportion is 80% for IT services companies and KPOs. However, it would take three times more effort and money to hire from tier 2 campuses for an IT-product position and two times more effort to hire for an IT services/KPO as compared to the Top 100 campuses. This explains why companies use **campus of higher education as a proxy to quality** to provide interview opportunity and why the supply of manpower is artificially low. Innovative models and the support of the government is required to bridge this gap to create a fair and healthy employability ecosystem.

V. The gap in skills for students in Top 100 vs. other campuses is not only in Computer Programming, but equally in English and Logical Ability. The gap in Quantitative Ability is the highest. This indicates that the Top 100 campuses have not done a spectacular job in transforming the skills of the admitted candidates, but simply attract better students at the intake. This requires further study and intervention.

VI. It is found that campuses in tier 2 cities have a comparable percentage (to tier 1 cities) of students eligible for BPO and technical support jobs. This indicates great economic advantage in setting support centers and BPOs in tier 2 cities with employees as talented as those in tier 1 cities and at a lower cost.

VII. The drop in employability for campuses in tier 2 cities with regard to IT services/product companies and KPOs ranges from 25% to 40%. This still leaves a good percentage of employable people in tier 2 cities and demonstrates high potential which may be developed further.

VIII.Contrary to popular belief, the skill gap in tier 2 city campuses vs. those in Tier 1 cities is not only in English. The gap is uniform across all areas ranging from 6 to 9 percentile points. Thus, the current

intervention in soft-skills and personality-development is an incomplete approach to solve the problem of employability enhancement. A more comprehensive approach across abilities needs to be taken for proper employability enhancement.

IX. Males and females have equivalent employability with regard to the IT industry, contrary to beliefs otherwise. The ratio in educational colleges is 1 female to 3 males whereas the ratio for females employed in IT industry is 1 female to 4.76 males (as studied in 2003).

X.   It is observed that MCA students have great potential with regard to IT Product companies if their quantitative and English communication skills are improved. They do better than Engineers in Programming Skills, whereas they are not as good as engineers in English, Logical and Quantitative ability.

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