Social Networks in Academia for Faculty Recruitment

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Introduction

The educational background and experience of faculty at a university has an undeniable impact on the quality of education it offers, even more so for a recently-established institution. Given the weight of personal recommendations along with better academic output among strong interpersonal relations among faculty, this study explores the social network of Habib University faculty with respect to their prior or current affiliations with other universities.

Research Questions

- Can a network be constructed for faculty members with respect to their association with other universities?
- Are there any significant communities in this network?
- Is there a network effect in faculty joining Habib University?
- How globally diverse are the Habib University faculty in terms of their associations with other universities?

Hypothesis #1

A well-connected, globally-distributed network exists.

Hypothesis #2

There is a possible bias towards recruitment of faculty that have studied abroad.

Methodology

DATA COLLECTION
Acquired a list of faculty and web scraped for information on universities they were affiliated with.

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DATAPOINTS

NETWORK CONSTRUCTION
Processed raw data into edgelists using MS Excel, for 83 faculty members.

NETWORK VISUALIZATION
Visualized the edgelists as networks with changes in color, size, layout, and labels. Analysed using network measures.

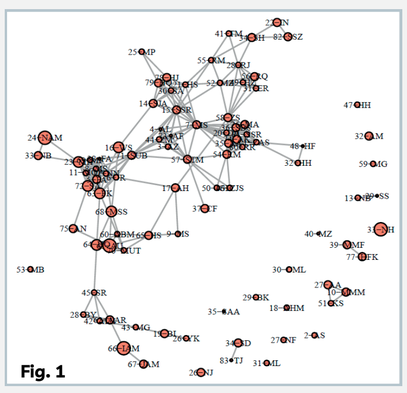
Fig. 1

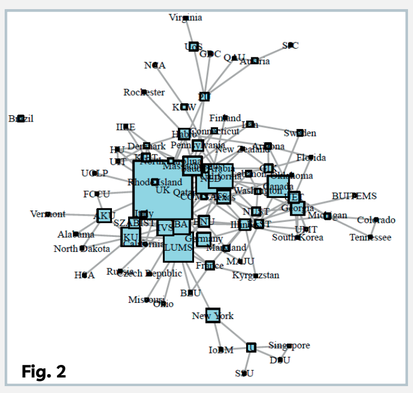
Fig. 2

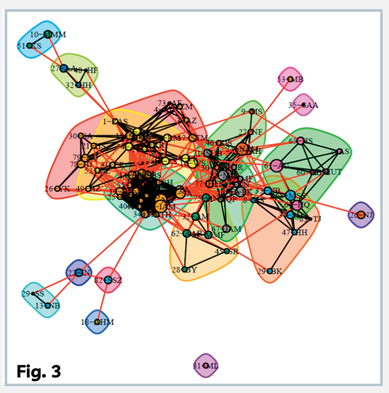
Fig. 3

Figure 1: *Initial network generated with all universities added regardless of region.* ***Figure 2:*** *Network with nodes and edges swapped.* ***Figure 3:*** *Network with communities highlighted.*

Results

Network Created:

- Unipartite
- Undirected
- Nodes: faculty members
- Edges: common universities

Table 1. *Network analysis for faculty network.*

Measure	Network in Figure 2
# Nodes	93
Max Degree	29
Mean Degree	11.2
Min Degree	0
# Nodes Max Degree	1
# Isolated Nodes	1
# Nodes Degree > Mean Degree	39
Edge Density	0.122
Avg. Clustering Coefficient (CC)	0.656
# Nodes with CC < Avg. CC	41
# Communities	18
Average Path Length	2.79

Discussion

The focus of the analysis is primarily on degree centrality, as degree of a node tells us how many faculty members that node shares a university with.

The network measures in Table 1 give us some insights:

- CC shows good clustering
- Well-connected, only 1 isolated node
- APL implies small-world effect
- On average each faculty member has a university common with 11 others.

Other insights:

- The UK is most popular as university region.
- Global spread of universities can be seen in Figure 2.
- 42% faculty share a university with 11 or more others

Comparison with Erdos-Renyi Network

- Similar to ER network as they both have small world effect.
- Dissimilar as faculty network has clusters, unlike ER.
- Dissimilar as degree distribution (Figure 5) is not Gaussian as is true for ER.

Fig. 5 *Degree distribution of faculty network.*

Limitations

- Study only includes current faculty, and not previous ones.
- Small dataset
- Human errors in manual data curation

Fig. 4 *Faculty network where nodes represent faculty members and edges represent a common "university" studied or worked at. Here the granularity was changed depending on region. For universities in Pakistan, their names were used. For those in the US, their state was used. For those in other countries abroad, the country was used.*

Conclusion

Our hypotheses appear to hold as we were able to construct a network as proposed. Moreover, the network is well-connected, with the UK being a popular region. On average 11 people share a common university, which leads to the possibility of a network effect in recruitment. Moreover, most faculty appear to have global exposure, which lends to the possibility of that being a preference of the university.

References

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