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Maritime sector has always been influencing the global economy. Shipping facilitates the bulk transportation of raw material, oil and gas products, food and manufactured goods across international borders. Shipping is truly global in nature and it can easily be said that without shipping, the intercontinental trade of commodities would come to a standstill.

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BEST PRACTICES FOR UNDERGRADUATE EDUCATION IN TRANSPORTATION

Amit Mokashi

An hourglass model is proposed here for undergraduate education in transportation. This model is based on the generic hourglass model suggested by Indira Nair\(^1\). A student starts his/her undergraduate education with a broad foundation in professional and general skills such as personal development, study skills, research skills, business communication, project management, decision making, \textit{etc}. These skills are necessary for the students to develop the maturity to appreciate what they will be exposed to not just academically during their education but also professionally during a possible internship or their eventual careers in the industry. Study done by Wong \textit{et al}.\(^2\) has found a greater demand for these skills than subject knowledge amongst employers for entry level logistics positions in UK.

The exploration phase continues with exposure to fundamentals of transportation system as suggested by Sussman\(^3\). This includes an overview of all modes, supporting infrastructure, vehicles, power, fuels, controls \textit{etc}. and their interrelations. Exposure to the fundamentals would better prepare the students to make a decision on which mode to specialize in \textit{i.e.} trucking, rail, pipelines, marine and aviation. Specialization at an undergraduate level should be by mode so as to create a more marketable profile. This is also an appropriate time to expose them to two overarching principles that the students would need to appreciate throughout; those of transportation having derived demand (emphasizes the need to appreciate the shipper’s business environment) and the transportation service variables\(^4\) \textit{i.e.} price, travel time, reliability, frequency, flexibility \textit{etc}. The second stage would be that of the student specializing by selecting a mode for more detailed study. At this stage the student decides which mode he/she has an affinity for. The student now is in a better position to make this academic as well as career choice after being exposed to the mechanics of each mode. Students often enter an undergraduate program with unrealistic vocational expectations. Delaying this decision permits them to make a more mature choice.

\(^1\) Assistant Professor of Management, New Jersey City University, New Jersey, USA. Email Id:- AMokashi@njcu.edu, amit_j_m@yahoo.co.in
Finally, the hourglass model encourages the student to generalize (broaden) their skill set within the selected mode. It would be fair to assume that they would have to have that flexibility as they progress in their careers. It does tend to be common for a new entrant in transportation to start at an operational level then progress to management with subsequent migration to policy. There are also many instances of transportation professionals making horizontal shifts in to from engineering to commercial operations to management etc. This is often actively encouraged by the employers to ensure better exposed senior staff. The student should complete their education with at least one of the following two capstone assignments; a research project and/or internship. Both these options give the student the opportunity to apply their academic knowledge as well as gain transferable soft skills. Research projects tend to increase the student’s interest in further education\textsuperscript{[5]}, while internships seem to help secure a career-oriented positions after graduation\textsuperscript{[6]}.

Figure below graphically represents this hourglass approach. Note; the semester numbers are included only as a guide for the general direction of flow and are not meant as a rigid prescriptive timeline adapted from Indira Nair’s\textsuperscript{[1]} generic hourglass model by Amit J. Mokashi using recommendations from the works of Sussman\textsuperscript{[3,4]}, and Wong et al\textsuperscript{[2]}.

\textbf{Figure 1.:} Hourglass model for undergraduate transportation curriculum
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About the Author

Amit Mokashi

He is a marine engineer with an unlimited Chief Engineer’s license for steam and motor ships. He has a M.Sc. in maritime operations (UK) and a Ph.D. in marine policy (USA). This presentation is based on his post-doctoral research in adoption of alternative fuels with Grenoble École de Management (France). He is currently working as an Assistant Professor at the New Jersey City University and teaches management and transportation.
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