Demonstrable skills and qualities referred to as graduate attributes become the central goal of all academic programs to ensure that they produce graduates well prepared and equipped to meet the demands of industry and society. Though most assessment methods are effective, self-assessment may help students reflect on their own learning and capabilities. This mixed method study explored the use of a structured self-assessment inventory tool to gauge the attainment level of graduate attributes of senior Computer Engineering students. Qualitative analysis of data from interview and prove-it statements were collected and analyzed. Results of the study showed that students perceived themselves to have Basic to Adequate competency level of the core and generic attributes. Further, they emphasized the need for developing their problem-solving skills, design and development skills, communication and team skills to become members of the competitive workforce after graduation.