The purposes of this study were to evaluate the ability of a group of third-year dental students without any endodontic clinical experience to use the ProTaper Instruments (Dentsply Maillefer) to decrease the amount of straightening of curved canals on human molar teeth and to determine the incidence of instrument fractures and instrumentation time. Thirty-one undergraduate dental students in Turkey received a training session. The students prepared a total of 144 root canals in human mandibular or maxillary molar teeth with ProTaper. Fifty-six teeth were excluded due to unreadable image, misinformation, or straight or severe curve. Using pre- and post-preparation digital radiographs, the straightening of curved root canals was investigated. Loss of working length and incidence of fracture were also noted. A total of eighty-eight curved root canals were selected. Mesiobuccal or mesiolingual roots with curvatures of between 20° and 43° as assessed by Schneider's method and working length of between 15 mm and 22.5 mm were included in the study. The means of the curved root canals before and after the instrumentation were 29.5° ±6° and 27° ±6.3°, respectively. The means of the working length before and after the instrumentation were 19 mm ±2.1 mm and 18.3 mm ±1.9 mm, respectively. A statistically significant difference between straightening of curved root canals and loss of working length was found between before and after instrumentation (p<0.000). The mean straightening of curved root canals and loss of working length after preparation with the size F1 ProTaper file were 2.5 mm ±3.6 mm and 0.7 mm ±0.6 mm, respectively. Only two F1 ProTaper instruments fractured at the apical level. The study concluded that rotary instruments performed adequately with inexperienced operators who received a brief structured training session.