Introduction: In order to alleviate the correct planning of liver resections various liver planning systems have been tried in the past couple of years. Of all established systems the in between correlation of those using 3D and augmented reality with the real surgical situs has been reported to be best. The aim of the presented study was to investigate if students who are provided different surgical planning platforms are able to locate the tumor.

Methods: Students were provided a 2D and a 3D as well as a virtual reality (VR) liver surgery planning system which consisted of 15 scenes. The included scenes were created in an afferent modus – starting from simple 2D imaging ending up in virtual reality. Several standardized tasks and measurements had to be performed in each scene in a defined time span of 5 minutes each.

Results: Forty students were included into the presented analysis. Overall skilled students (last 2 years of medical university) needed less time to perform the tasks (mean time all scenes: 3.1 0.5 min vs. 4.4 1.0 min, p=0.003), whereas students in the second and third year needed less time to perform tasks in virtual reality as compared to 2D and 3D imaging (mean time 2D: 1.9 0.4 min vs. 4.0 0.9 min, p=0.001; mean time 3D: 2.5 1.6 min vs. 3.2 0.5 min, p=0.05; mean time VR: 4.5 0.9 min vs. 2.5 1.2, p=0.001).

Conclusion: Students are definitely able to locate and even diagnose a tumor based on 2D, 3D or augmented reality. There might be an application of 2D/3D or augmented reality scenes to enhance teaching especially in the surgical field.