Figure 3.1 Overall Architecture of KE in VR-ITS

IPA

Instruction Provider

Task-driven Knowledge

OGMB

FITT

Trouble-Shooting

Impasse-driven Knowledge

AMB

TSTP

ITPA

Dynamic Plan Recognition

State Information

Training Task Provider

PR

Mapping

TP Base

GD

State Information

Training Plan

Domain Experts

Trainee Model

State Information

TH Base

Evaluation

Trainees

Virtual Training Environment
The hardware environment of VR-CNC (Figure 5.1) includes SGI Onyx2 workstation, Acoustetron II 3-D Sound Server, VR4 HMD or CrystalEyes VR LCD Shuttle Glasses, Fastrak position and orientation Tracker.
The comparison between the real CNC milling machine prototype and the virtual one are shown in Figure 5.4 and Figure 5.5.

Figure 5.4 Components of the actual CNC milling machine.

Figure 5.5 Graphical model of the three-axis CNC milling machine model
The workpiece used in this study for milling machine operations is shown in Figure 5.7 and the final product after machining is shown in Figure 5.8.

Figure 5.7 Workpiece

Figure 5.8 Final product
Figure 5.11: The snapshot of 3-D text instructions in the VR-CNC training system