

The MDPI Analytics

A key element of the MDPI is its Analytics. These Analytics are an Expert System (ES) that interprets a student's performance in the diagnostics exam. An ES is a computer application that emulates the decision-making ability of human experts. ESs are used extensively in the field of medicine. The MDPI extends their use to the assessment of mathematics diagnostics, and the generation of a student's Mathematics Learning Profile (MLS). Understanding the particular student's MLP helps his support team to prescribe an appropriate intervention. For more information on the MLP, please see that section on the website.

The ES incorporates the knowledge, research and experience that the authors have acquired over forty years in clinical practice, and decades of working in the classroom.

The internal structure of the MDPI expert system consists of three parts:

- the database, which includes the individual scores and observations from the MDPI diagnostic test of the student;
- the knowledge base, which is derived from the expertise of the MDPI author team;
- the inference engine that uses the knowledge base to help interpret the results of the diagnostic exam.

The most important part of the system is the knowledge base which holds the set of inference rules that are used in reasoning and diagnosis. Most expert systems use IF-THEN rules to represent the knowledge. This is the case with the MDPI approach.

Typically, Expert Systems can have a few hundred to a few thousand rules. The MDPI system uses these rules, that were established by the authors, to interpret the results of the student's performance. The ES output can be used to design options for an intervention program.

These ES rules were developed by matching the inference engine output to the authors' interpretations. Enough comparisons were made of the ES outputs to the authors' independent decisions about those results, for the team to have a high level of confidence in the MDPI Expert System's results. This includes the system's generation of the particular student's Math Learning Profile.

It is important for users to realize that the MDPI expert system is for decision support, not for decision-making. Its function is to provide the professionals on the student's team with important issues to consider and alternatives to explore. The MDPI presumes that examiners will then use their own best judgments to review the findings and add their own insights, emphases and recommendations where required.