One of the goals of many undergraduate theory curricula is for students to move beyond simply assigning Roman numerals to vertical sonorities toward a higher-level understanding of harmonic function. The “phrase model” provides music theory students with the tools for identifying tonic, predominant, and dominant function at the phrase level and thus acts as a building block for achieving a higher-level understanding of tonal music. It is described in Steve Laitz's textbook The Complete Musician through a combination of written rules and labelled musical examples. Computational modelling provides an opportunity to evaluate the relative contributions of these two pedagogical methods; the rules outlined in the texts were converted into functional algorithms and the musical examples were modelled with an exemplar–based probabilistic approach, namely a hidden Markov model (HMM). A third model was also developed, which combined the Rule– and Exemplar–based models. When evaluated on both the textbook examples and exercises from the corresponding workbook, the Rule– and Exemplar–based models exhibited different strengths and the Combined model outperformed both. This indicates that both approaches have unique information that is necessary to produce an appropriate phrase–level analysis from Roman numerals.