

ABSTRAK

Pada mata kuliah pemrograman, mahasiswa mempunyai aktivitas dan pola proses pembelajaran *e-learning* yang berbeda. Pola proses pembelajaran tersebut dapat mempengaruhi keberhasilan belajar mahasiswa dalam situasi tertentu. Mata kuliah pemrograman merupakan mata kuliah tahapan persiapan bersama serta mata kuliah landasan di semester selanjutnya, sehingga penting bagi mahasiswa dan dosen untuk meningkatkan pembelajaran pada mata kuliah pemrograman. Berdasarkan hal tersebut, penelitian ini menganalisis dan merekomendasikan pola yang tepat pada pembelajaran pemrograman dengan menggunakan *event log*. *Event-log* yang ada pada matakuliah pemrograman mempunyai banyak aktivitas meliputi melihat modul pembelajaran, modul praktikum, quiz, dan ujian tengah semester (UTS). Pengambilan data pada penelitian ini akan dilakukan di Pusat Teknologi Informasi (PUTI) pada website *E-learning* di Institut Teknologi Telkom Surabaya yang berfokus pada mata kuliah pemrograman di program studi Sistem informasi dengan data yang digunakan meliputi *case-id*, aktivitas, nilai matakuliah, waktu kegiatan dan waktu selesai kegiatan. Penelitian ini menggunakan metode algoritma alpha miner karena metode alpha miner dapat membangun model proses berdasarkan *event log* dengan memahami hubungan dan kausalitas. *Process mining* dilakukan dengan tiga tahapan yaitu Proses *discovery*, *conformance checking*, dan *enhancement*. Penelitian ini berfokus Proses *discovery* sampai *conformance checking* terhadap peningkatan pembelajaran mata kuliah pemrograman. Hasil dari algoritma alpha miner dapat memodelkan *Event Log* kedalam model proses dengan baik, dilihat dari perhitungan nilai *fitness* mata kuliah Pemrograman Website IS-04-01 menunjukkan nilai 0.76. Sedangkan, nilai *fitness* mata kuliah Pemrograman Framework IS-03-03 menunjukkan nilai 0,41. Dengan nilai yang mendekati angka 1, dapat disimpulkan bahwa pola pembelajaran mahasiswa terhadap penggunaan *e-learning* sudah cukup baik.

Kata Kunci: *Alpha Miner, Process Mining, Process Discovery, Event Log, Fitness.*

ABSTRACT

In programming courses, students have activities and learning process patterns-learning differently. This learning process pattern can influence student learning success in certain situations. The programming course is a joint preparatory stage course as well as a foundation course in the following semester, so it is important for students and lecturers to improve learning in programming courses. Based on this, this research analyzes and recommends appropriate patterns for learning programming using event *log*. *Event-log* programming course has many activities including viewing learning modules, practicum modules, quizzes, and mid-semester exams (UTS). Data collection for this research will be carried out at the Information Technology Center (PUTI) on the website *E-learning* at the Telkom Institute of Technology Surabaya which focuses on programming courses in the Information Systems study program with the data used including case-id, activity, course value, activity time and activity completion time. This research uses the alpha miner algorithm method because the alpha miner method can build process models based on event *log* by understanding relationships and causality. The mining process is carried out in three stages, namely Process Discovery, *conformance checking*, and enhancement. This research focuses on Process Discovery until *conformance checking* towards improving learning in programming courses. The results of the alpha miner algorithm can be modeled *Event Log* into the process model well, seen from the value calculations fitness. The IS-04-01 Website Programming course shows a score of 0.76. Meanwhile, value *fitness* IS-03-03 Framework Programming course shows a value of 0.41. With a value close to 1, it can be concluded that students' learning patterns are related to use *e-learning* it's good enough.

Keywords: *Alpha Miner, Process Mining, Process Discovery, Event Log, Fitness.*