

**PENGEMBANGAN *DIGITAL STATISTICS COMIC*
PADA *STATISTICAL REASONING LEARNING ENVIRONMENT*
UNTUK MENINGKATKAN KEMAMPUAN PENALARAN
DAN MINAT STATISTIS SISWA**



Disertasi

**Diajukan Sebagai Salah Satu Syarat untuk Memperoleh
Gelar Doktor dalam Pendidikan Matematika**

Oleh:

Farid Gunadi

NIM. 2105050

**PROGRAM STUDI PENDIDIKAN MATEMATIKA
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS PENDIDIKAN INDONESIA
2025**

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Oleh
Farid Gunadi

S.Pd. Universitas Wiralodra, 2006
M.Pd. Universitas Indraprasta PGRI, 2015

Sebuah Disertasi yang diajukan untuk memenuhi salah satu syarat memperoleh
gelar Doktor Pendidikan Matematika (Dr.)
pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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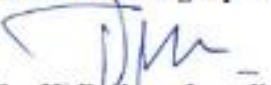
Oleh
Farid Gunadi

**Disetujui dan Disahkan oleh Tim Penguji Disertasi:
Promotor Merangkap Ketua**



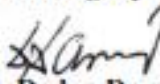
**Prof. H. Yaya Sukjaya Kusumah, M.Sc., Ph.D.
NIP. 19590922 1983 031 003**

Ko-Promotor 1 Merangkap Sekretaris



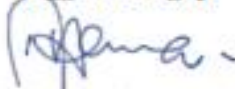
**Prof. Dr. H. Dadang Juandi, M.Si.
NIP. 19640117 1992 021 001**

Ko-Promotor 2 Merangkap Anggota Penguji



**Prof. Dr. Dadan Dasari, M.Si.
NIP. 19640717 1991 021 001**

Anggota Penguji



**Prof. H. Tatang Herman, M.Ed.
NIP. 19621011 1992 032 001**

Anggota Penguji



**Prof. Dr. Sugiman, M.Pd.
NIP. 19650228 1991 011 001**

**Mengetahui,
Ketua Program Studi Pendidikan Matematika**



**Dr. Jarnawi Afgani Dahlan, M.Kes.
NIP. 19680511 1991 011 001**

ABSTRAK

Farid Gunadi (2105050). Pengembangan *Digital Statistics Comic* pada *Statistical Reasoning Learning Environment* untuk Meningkatkan Kemampuan Penalaran dan Minat Statistis Siswa.

Penelitian ini bertujuan untuk mengembangkan bahan ajar digital *Statistics Comic* pada *Statistical Reasoning Learning Environment* (SRLE) yang valid, praktis, dan efektif untuk meningkatkan penalaran dan minat statistis siswa. Pengembangan ini dilatarbelakangi oleh rendahnya kemampuan penalaran statistis dan kurangnya minat siswa karena dianggap jauh dari relevansi kehidupan sehari-hari. Untuk menjawab tantangan tersebut, dikembangkan bahan ajar dalam bentuk komik digital yang dikemas secara kontekstual, visual, dan interaktif agar lebih menarik serta mudah dipahami oleh siswa. Pendekatan ini mengintegrasikan visualisasi naratif dalam komik digital dengan prinsip SRLE untuk menciptakan pembelajaran statistis yang kontekstual dan interaktif serta relevan dengan kebutuhan literasi data di era Industri 4.0 dan Society 5.0. Model pengembangan yang digunakan adalah ADDIE (*Analysis, Design, Development, Implementation, dan Evaluation*). Pada tahap *Analysis*, dilakukan identifikasi kebutuhan siswa, guru, serta karakteristik materi statistis. Tahap *Design* mencakup perancangan konten, alur cerita, elemen visual, dan strategi pembelajaran berbasis SRLE. Pada tahap *Development*, produk dikembangkan melalui aplikasi desain grafis dan platform digital, kemudian divalidasi oleh ahli materi, media, dan pedagogi untuk memenuhi kriteria valid. Pada tahap ini juga produk diuji cobakan melalui *pilot test* untuk mengukur kepraktisan produk. Setelah itu, tahap *Implementation* dilakukan melalui uji coba pada siswa kelas X di dua sekolah tingkat menengah atas untuk mengukur efektivitas produk. Tahap terakhir, yaitu *Evaluation*, mencakup evaluasi formatif dan sumatif terhadap bahan ajar dalam meningkatkan penalaran statistis serta minat belajar siswa secara valid, praktis, dan efektif. Hasil penelitian menunjukkan bahwa bahan ajar *Statistics Comic* dinilai valid oleh para ahli dari segi isi, tampilan, bahasa, dan keterpaduan dengan SRLE. Uji kepraktisan menunjukkan bahwa guru, observer, dan siswa memberikan respons positif sebesar 86% terhadap kemudahan penggunaan, daya tarik, dan kejelasan isi komik digital. Sementara itu, hasil uji efektivitas menunjukkan adanya peningkatan signifikan pada kemampuan penalaran statistis siswa setelah menggunakan bahan ajar, yang diukur melalui *pretest* dan *posttest*. Selain itu, minat siswa terhadap materi statistis meningkat secara nyata, tercermin dari antusiasme dalam berdiskusi, menyelesaikan tugas, dan keterlibatan aktif selama pembelajaran berlangsung. Dengan demikian, pengembangan bahan ajar digital *Statistics Comic* terbukti valid, praktis, dan efektif dalam meningkatkan penalaran dan minat statistis siswa. Penelitian ini memberikan kontribusi terhadap pengembangan sumber belajar yang sesuai dengan kebutuhan abad ke-21 dan mendukung pembelajaran berbasis penalaran statistis.

Kata Kunci: Bahan Ajar Digital *Statistics Comic*, *Statistical Reasoning Learning Environment*, Penalaran Statistis, dan Minat Statistis.

ABSTRACT

Farid Gunadi (2105050). The Development of Digital Statistics Comic in Statistical Reasoning Learning Environment to Enhance Students' Reasoning Ability and Statistical Interest.

This study aims to develop digital teaching materials of “Statistics Comic” on the Statistical Reasoning Learning Environment (SRLE) that are valid, practical, and effective to enhance students' statistical reasoning and interest. This development is motivated by the low statistical reasoning ability and lack of students' interest, it is because considered as something that is not relevance to everyday life. To answer these challenges, open materials were developed in the form of digital comics that are packaged contextually, visually, and interactively to make students more interested and easy for them to understand. This approach integrates narrative visualization in digital comics with SRLE principles to create contextual and interactive statistical learning that is relevant to data literacy needs in the Industry 4.0 and Society 5.0 eras. The development model used is ADDIE (Analysis, Design, Development, Implementation, and Evaluation). In the phase of Analysis, it is focused on identifying the needs of students, teachers, and characteristics of statistical materials is carried out. The Design stage includes designing content, storylines, visual elements, and learning strategies based on SRLE. In terms of Development, the product is developed through graphic design applications and digital platforms, then validated by the experts in order to meet the criteria for validity. In this case, the product is also tested to measure the practicality of the product. Meanwhile, the phase of Implementation is applied to measure the effectiveness of the product, here, the product was tested to the 10th Grade students of two senior high schools. The last phase of ADDIE is Evaluation, it includes formative and summative evaluations which assess the validity, practicality, and efectivity of teaching materials in enhancing students' statistical ability and interest. In relating to the result of study, experts agree that the use Statistics Comic as learning media was considered valid dealing with content, appearance, language, and integration with the SRLE. Moreover, the Practicality tests showed that teachers, observers, and students gave positive response as many as 86% to the ease of use, attractiveness, and clarity of the contents of digital comics. Besides, the results of pretests and posttests also reflected a significant increase in students' statistical abilities after using the teaching materials. In addition, the students' interest in statistical materials increased significantly, it is indicated in their enthusiasm in doing discussions, assignments, and classroom activity. Therefore, the development of digital Statistics Comic as teaching materials has proven to be valid, practical, and effective in enhancing students' statistical ability and interest. In this regard, this study contributes to the development of learning resources that are in accordance with the needs of the 21st century and support statistical reasoning-based learning.

Keywords: Digital Statistics Comic Teaching Materials, Statistical Reasoning Learning Environment, Statistical Reasoning, and Statistical Interest.

KATA PENGANTAR

Segala puji bagi Allah SWT atas rahmat dan karunia-Nya sehingga penulis dapat menyelesaikan disertasi ini dengan baik. Shalawat dan salam semoga senantiasa tercurah kepada Rasulullah Muhammad SAW, pembawa rahmat bagi seluruh alam. Disertasi ini disusun sebagai salah satu syarat untuk memperoleh gelar doktor, dengan judul “Pengembangan *Digital Statistics Comic* pada Statistical Reasoning Learning Environment untuk Meningkatkan Kemampuan Penalaran dan Minat Statistis Siswa.” Penulisan disertasi ini merupakan hasil bimbingan dari Promotor, Ko-Promotor, dan Anggota, berdasarkan arahan dan petunjuk yang telah diberikan kepada penulis.

Penulis juga menyampaikan terima kasih yang sebesar-besarnya kepada para pembimbing disertasi. Kepada Bapak Prof. H. Yaya S. Kusumah, M.Sc., Ph.D., selaku Promotor, yang telah dengan sabar dan penuh dedikasi membimbing serta mengarahkan penulis dalam menyelesaikan disertasi ini. Ucapan terima kasih juga disampaikan kepada Bapak Prof. Dr. H. Dadang Juandi, M.Si., selaku Ko-Promotor dan dosen pembimbing akademik, atas motivasi dan arahan yang sangat berarti selama proses penulisan. Selanjutnya, penulis berterima kasih kepada Bapak Prof. Dr. Dadan Dasari, M.Si., selaku Anggota Promotor disertasi, atas berbagai masukan konstruktif, baik dari sisi analisis maupun perbaikan isi tulisan.

Penulis menyampaikan terima kasih yang sebesar-besarnya kepada Bapak Dr. Jarnawi Afgani Dahlan, M.Kes. dan Ibu Dr. Eyus Sudihartini, S.Pd., M.Pd., selaku Ketua dan Sekretaris Program Studi Pendidikan Matematika FPMIPA Universitas Pendidikan Indonesia, atas pelayanan dan dukungan terbaik yang telah diberikan selama penulis menempuh studi. Ucapan terima kasih juga disampaikan kepada Bapak Prof. Dr. rer. Nat. Adi Rahmat, M.Si., selaku Dekan FPMIPA, atas kebijakan yang mendukung proses pembelajaran penulis di Program Studi Pendidikan Matematika khususnya pada jenjang S3.

Selain itu, penulis menyampaikan penghargaan setinggi-tingginya kepada para dosen S3 Program Studi Pendidikan Matematika FPMIPA Universitas Pendidikan Indonesia atas ilmu, bimbingan, dan pengalaman berharga yang telah

diberikan selama perkuliahan. Tak lupa, ucapan terima kasih ditujukan kepada seluruh staf Tata Usaha (TU) Program Studi Pendidikan Matematika yang telah memberikan pelayanan administrasi dengan penuh profesionalisme dan dedikasi selama masa studi.

Penulis mengucapkan terima kasih kepada Kepala MAN 1 Indramayu dan SMA Negeri 2 Indramayu tahun akademik 2023/2024 atas bantuan dan dukungan yang diberikan selama pelaksanaan penelitian disertasi. Ucapan terima kasih juga disampaikan kepada Bapak Tamurih, S.Pd., M.Si. atas bantuannya dalam pelaksanaan kegiatan disertasi. Selain itu, penulis menyampaikan apresiasi kepada Ibu Nedia Rose, S.Pd., dan Ibu Ade Indri Lestari, S.Pd. yang telah membantu dalam aspek teknis pembuatan bahan ajar Statcom.

Penulis juga bersyukur atas kehadiran istri tercinta, Devi Kurniana Sari, S.Pd., yang dengan kesabaran dan keteguhannya senantiasa mendampingi serta mendukung dalam proses penyelesaian disertasi dan pendidikan S3 ini. Ucapan terima kasih yang mendalam juga penulis sampaikan kepada almarhumah Ibu Maslikah dan Almarhum Bapak Wahidin, yang telah melahirkan dan membesarkan penulis dengan penuh kasih sayang, serta menginspirasi untuk selalu berusaha menjadi pribadi yang bermanfaat. Penulis juga menyampaikan terima kasih kepada mertua tercinta, Mamah Kurniah dan Papah Rasa, yang telah menjadi sosok orang tua kedua bagi penulis. Dukungan moral dan spiritual yang mereka berikan menjadi kekuatan tersendiri dalam menyelesaikan disertasi ini.

Penulis mengucapkan terima kasih yang tulus kepada teman-teman Angkatan 2021 Program Studi Pendidikan Matematika S3 Universitas Pendidikan Indonesia, yang telah menjadi sahabat dan rekan sejati sepanjang perjalanan studi. Kehadiran kalian menciptakan suasana akademik yang kondusif dan penuh semangat, serta selalu memberikan dukungan moral yang sangat berarti dalam proses penyelesaian disertasi ini. Terima kasih atas kebersamaan, keceriaan, dan kerja sama yang telah membentuk momen-momen berharga dalam episode kehidupan Pendidikan S3 di Universitas Pendidikan Indonesia. Persahabatan dan solidaritas yang terjalin menjadi sumber motivasi dan inspirasi yang tak tergantikan bagi penulis.

Akhirnya, disertasi ini merupakan karya penulis yang telah diupayakan dengan penuh kesungguhan untuk menjunjung kebenaran dan keutamaan dalam membangun ilmu pengetahuan. Namun, penulis menyadari bahwa tidak ada karya manusia yang sempurna. Oleh karena itu, penulis sangat terbuka terhadap kritik dan saran yang membangun sebagai bagian dari proses perbaikan di tahap-tahap berikutnya. Kritik dan saran tersebut akan menjadi pelajaran berharga untuk pengembangan karya dan peningkatan kualitas penelitian di masa mendatang.

Bandung, 2025

Farid Gunadi

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