

# CITATION REPORT

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**Group model building: adding more science to the craft**

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#	Paper	IF	Citations
207	Investigating the Benefits of Group Model Building Using System Dynamics for Engineers Without Borders Students. <b>2015</b> , 26.1039.1		1
206	From Discussion to Dialogue: A Case Study Using an Interactive System Dynamics Modelling Approach. <b>1997</b> , 6, 251-281		3
205	Consulting approaches with system dynamics: three case studies. <i>System Dynamics Review</i> , <b>1999</b> , 15, 71-95	1.6	6
204	Group model-building: tackling messy problems. <i>System Dynamics Review</i> , <b>1999</b> , 15, 379-401	1.6	341
203	Towards a conceptual structure for evaluating policy analytic activities. <b>2001</b> , 129, 627-649		37
202	Implementing recommendations as a result of a system dynamics intervention.		0
201	Rapid Assessment of Water Systems based on Internal Consistency. <b>2002</b> , 128, 240-247		6
200	Group model building effectiveness: a review of assessment studies. <i>System Dynamics Review</i> , <b>2002</b> , 18, 5-45	1.6	246
199	Client involvement in simulation model building: hints and insights from a case study in a London hospital. <b>2003</b> , 6, 105-16		47
198	Unlocking complexity: The importance of idealisation in simulation modelling. <b>2003</b> , 2, 293-312		8
197	Participatory modelling to enhance social learning, collective action and mobilization among users of the mafungautsi forest, Zimbabwe. <b>2003</b> , 2, 313-326		21
196	Group exploration of system dynamics models: is there a place for a feedback loop in the decision process?. <i>System Dynamics Review</i> , <b>2003</b> , 19, 243-263	1.6	37
195	Participatory Modelling in Environmental Decision-Making: The Ria Formosa Natural Park Case Study. <b>2003</b> , 05, 421-447		40
194	A four-role model of the automotive industry development in developing countries: a case in Taiwan. <b>2004</b> , 55, 1145-1155		33
193	Using neural networks and cognitive mapping in scenario analysis: The case of Turkey's inflation dynamics. <b>2004</b> , 158, 124-145		17
192	Soft System Dynamics Methodology (SSDM): Combining Soft Systems Methodology (SSM) and System Dynamics (SD). <b>2005</b> , 18, 303-334		50
191	An Extended Tourism Information Architecture: Capturing and Modelling Change. <b>2005</b> , 1-12		3

190	Information Systems Development. <b>2005</b> ,		5
189	A system dynamics model of the semiconductor industry development in Taiwan. <b>2005</b> , 56, 1141-1150		20
188	The social dimension of system dynamics-based modelling. <b>2006</b> , 23, 553-563		14
187	System dynamics and organizational interventions. <b>2006</b> , 23, 451-466		69
186	Action research cycles for multiple futures perspectives. <b>2006</b> , 38, 673-684		39
185	Endowing cognitive mapping with computational properties for strategic analysis. <b>2006</b> , 38, 993-1009		19
184	Linking event thinking with structural thinking: methods to improve client value in projects. <i>System Dynamics Review</i> , <b>2006</b> , 22, 113-140	1.6	48
183	Anatomy of a group model-building intervention: building dynamic theory from case study research. <i>System Dynamics Review</i> , <b>2006</b> , 22, 291-320	1.6	100
182	Using system dynamics for theory building in digital government research. <b>2006</b> ,		0
181	Lessons learned from unsuccessful modelling interventions. <b>2006</b> , 23, 483-492		12
180	System dynamics modelling for strategy implementation—base study and issues. <b>2006</b> , 23, 467-481		22
179	It works in practice but does it work in theory?. <b>2006</b> , 23, 565-570		8
178	The Usage of System Dynamics in Organizational Interventions. <b>2007</b> ,		
177	Group model building: problem structuring, policy simulation and decision support. <b>2007</b> , 58, 691-694		160
176	System dynamics projects that failed to make an impact. <i>System Dynamics Review</i> , <b>2007</b> , 23, 437-452	1.6	17
175	The Role of Information Feedback in the Management Group Decision-Making Process Applying System Dynamics Models. <b>2007</b> , 16, 77-95		30
174	A system dynamics model as a decision aid in evaluating and communicating complex market entry strategies. <b>2008</b> , 61, 1173-1181		11
173	Developing land use and transport PSS: Meaningful information through a dialogue between modelers and planners. <b>2008</b> , 15, 251-259		81

172	The Organizing Pattern of Interaction: A Knowledge Centric Approach. <b>2008</b> ,		0
171	Modeling Boundaries of Concern among Conflicting Stakeholders. <b>2008</b> , 8, 255-262		2
170	The emergence and use of diagramming in system dynamics: a critical account. <b>2008</b> , 25, 3-23		127
169	Applying intelligent cultural networks to marketing analysis. <b>2009</b> , 26, 542-553		3
168	On Evaluating the Performance of Problem Structuring Methods: An Attempt at Formulating a Conceptual Model. <b>2009</b> , 18, 567-587		72
167	The Use of System Dynamics Simulation in Water Resources Management. <b>2009</b> , 23, 1301-1323		281
166	Simulating urban transformation in Haaglanden, the Netherlands. <i>System Dynamics Review</i> , <b>2009</b> , 25, 182-206	1.6	21
165	Emergent vulnerabilities in Integrated Operations: A proactive simulation study of economic risk. <b>2009</b> , 2, 110-123		13
164	Critical Information Infrastructure Security. <b>2009</b> ,		2
163	. <b>2009</b> ,		
162	Integrating modes of policy analysis and strategic management practice: requisite elements and dilemmas. <b>2009</b> , 60, 2-13		39
161	From Planning Support Systems to Mediated Planning Support: A Structured Dialogue to Overcome the Implementation Gap. <b>2010</b> , 37, 3-20		63
160	Modelling with stakeholders?. <b>2010</b> , 25, 1268-1281		785
159	Modeling as persuasion: the impact of group model building on attitudes and behavior. <i>System Dynamics Review</i> , <b>2010</b> , 27, n/a-n/a	1.6	11
158	Using a group decision support system to add value to group model building. <i>System Dynamics Review</i> , <b>2010</b> , 26, 335-346	1.6	25
157	The Integration of Systems Dynamics and Balanced Scorecards in Strategic Healthcare Policy Simulation Analysis. <b>2010</b> , 2, 10-34		1
156	Participative modelling and big issues: Defining features of system dynamics?. <b>2010</b> , 27, 461-465		14
155	A participatory modelling approach to support integrated sustainability assessment processes. <b>2010</b> , 27, 446-460		49

154	Using a system dynamics approach for identifying and removing management model inadequacy. <b>2010</b> , 39, 1583-1614		5
153	A participative modelling framework for developing conceptual models in healthcare simulation studies. <b>2010</b> ,		10
152	System dynamics approach to the financial crisis in elementary education system - a case in Taiwan. <b>2010</b> ,		1
151	E pluribus unum: using group model building with many interdependent organizations to create integrated health-care networks. <b>2011</b> , 10, 321-44		1
150	A new management approach to knowledge-creating strategic decision-making in organisations. <b>2011</b> , 10, 291		2
149	Sustainable Water Resource Management and Participatory System Dynamics. Case Study: Developing the Palouse Basin Participatory Model. <b>2011</b> , 3, 720-742		43
148	ScriptsMap: A tool for designing multi-method policy-making workshops. <b>2011</b> , 39, 427-434		59
147	Management Sciences/Operational Research Units in Business and Management Courses in the UK. <b>2011</b> , 24, 379-395		2
146	The relevance of facilitation in group decision making supported by a simulation model. <i>System Dynamics Review</i> , <b>2011</b> , 27, 270-293	1.6	22
145	A comprehensive method for comparing mental models of dynamic systems. <b>2011</b> , 210, 57-67		48
144	A Proposed Methodological Synthesis of Post-Keynesian and Institutional Economics. <b>2011</b> , 45, 819-838		6
143	Does Group Model Building Work? Evidence from and Comments on the Paper by Videira et al.. <b>2012</b> , 29, 620-623		6
142	Proposing a Participative Modelling Framework for Discrete Event Simulation Studies. <b>2012</b> ,		1
141	Facilitated conceptual modelling: Practical issues and reflections. <b>2012</b> ,		
140	System dynamics as a useful technique for complex systems. <b>2012</b> , 10, 377		96
139	Future Security. <b>2012</b> ,		1
138	Exploring Collaborative Modeling as Teaching Method. <b>2012</b> ,		1
137	Group Model-Building Scripts as a Collaborative Planning Tool. <b>2012</b> , 29, 179-193		146

136	Using Visual Representations as Boundary Objects to Resolve Conflict in Collaborative Model-Building Approaches. <b>2012</b> , 29, 194-208		85
135	Learning from Conflict Resolution: An Opportunity to Systems Thinking. <b>2012</b> , 29, 209-220		4
134	Are We Surrounded by Penguins? The Diffusion of System Dynamics in Academia Analysed with System Dynamics. <b>2012</b> , 29, 436-447		1
133	How do we know who to include in collaborative research? Toward a method for the identification of experts. <b>2012</b> , 216, 495-502		27
132	Using groups to support judgmental parameter estimation VISCONS: Eyeballing to capture a quantified group consensus. <b>2013</b> , 40, 715-721		2
131	Participatory modelling to support decision making in water management under uncertainty: two comparative case studies in the Guadiana river basin, Spain. <b>2013</b> , 128, 400-12		30
130	A system dynamics approach for poultry operation to achieve additional benefits. <b>2013</b> ,		1
129	A Case-Study of Wiki-Supported Collaborative Drafting of Business Processes Models. <b>2013</b> ,		3
128	When visuals are boundary objects in system dynamics work. <i>System Dynamics Review</i> , <b>2013</b> , 29, 70-86	1.6	69
127	Evaluating immediate and long-term impacts of qualitative group model building workshops on participants' mental models. <i>System Dynamics Review</i> , <b>2013</b> , 29, 216-236	1.6	32
126	Resilience Building Policies and their Influence in Crisis Prevention, Absorption and Recovery. <b>2013</b> , 10,		4
125	Expanding the frontiers of population nutrition research: new questions, new methods, and new approaches. <b>2013</b> , 4, 92-114		37
124	Enhancing resilience: implementing resilience building policies against major industrial accidents. <b>2013</b> , 9, 130		8
123	From stakeholders' competition to the balance of interests: system dynamics model of participatory policy. <b>2013</b> , 13, 294		2
122	A participative and facilitative conceptual modelling framework for discrete event simulation studies in healthcare. <b>2014</b> , 65, 197-213		61
121	Group Model-Building to identify potential sources of environmental impacts outside the scope of LCA studies. <b>2014</b> , 72, 96-109		21
120	Learning from discrete-event simulation: Exploring the high involvement hypothesis. <b>2014</b> , 235, 195-205		18
119	Handbook of Research methods and Applications in Environmental Studies. <b>2015</b> ,		8

118	The potential of learning from erroneous models: comparing three types of model instruction. <i>System Dynamics Review</i> , <b>2015</b> , 31, 250-270	1.6	5
117	Using participatory system dynamics in environmental and sustainability dialogues. 346-374		11
116	Planning robust policing futures: modelling using multimethodology. <b>2015</b> , 115, 462-482		
115	Connecting strategy and system dynamics: an example and lessons learned. <i>System Dynamics Review</i> , <b>2015</b> , 31, 149-172	1.6	14
114	Interpersonal success factors for strategy implementation: a case study using group model building. <b>2015</b> , 66, 1023-1034		14
113	WATERSTORY ILE: A Systemic Approach to Solve a Long-Lasting and Far-Reaching Problem. <b>2015</b> , 46, 404-429		12
112	Tools for Supporting Responsible Decision-Making?. <b>2015</b> , 32, 312-329		1
111	Modeling social norms and social influence in obesity. <b>2015</b> , 2, 71-79		50
110	Health and wellness programs for commercial motor-vehicle drivers: organizational assessment and new research directions. <b>2015</b> , 63, 71-80		25
109	Staying the Course: Collaborative Modeling to Support Adaptive and Resilient Water Resource Governance in the Inland Northwest. <b>2016</b> , 8, 232		14
108	Applying Critical Race Theory to Group Model Building Methods to Address Community Violence. <b>2016</b> , 10, 443-459		10
107	A competence development framework for learning and teaching system dynamics. <i>System Dynamics Review</i> , <b>2016</b> , 32, 52-81	1.6	14
106	Assessing the Participatory Potential of Systems Mapping. <b>2016</b> , 33, 496-514		18
105	Systemic Analysis of Pensions: The Case of the Taiwanese Primary School Teacher Pension Fund. <b>2016</b> , 33, 159-172		2
104	Client Perceptions of Reported Outcomes of Group Model Building in the New Zealand Public Sector. <b>2016</b> , 25, 77-101		10
103	Mechanisms for Understanding Mental Model Change in Group Model Building. <b>2016</b> , 33, 100-118		19
102	Using of Group-Modeling in Predesign Phase of New Healthcare Environments: Stakeholders Experiences. <b>2016</b> , 9, 69-81		8
101	Recent evidence on the effectiveness of group model building. <b>2016</b> , 249, 908-918		60

100	Behavioural operational research: Towards a framework for understanding behaviour in OR interventions. <b>2016</b> , 249, 827-841	45
99	How the European Union's and the United States' anti-dumping duties affect Taiwan's PV industry: A policy simulation. <b>2016</b> , 53, 296-305	16
98	A Community-based Complex Systems Approach to High School Completion. <b>2017</b> , 34, 267-276	2
97	System Dynamics as a Framework for Understanding Human-Environment Dynamics. <b>2017</b> , 25-36	1
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95	Theories and Models of Teams and Groups. <b>2017</b> , 48, 544-567	20
94	Participative Modelling of Socio-Technical Transitions: Why and How Should We Look Beyond the Case-Specific Energy Transition Challenge?. <b>2017</b> , 34, 469-488	14
93	Participatory system dynamics modelling for dairy value chain development in Nicaragua. <b>2017</b> , 27, 785-800	13
92	Environmental management maturity model for industrial companies. <b>2017</b> , 28, 632-650	8
91	Framework to assess organizational readiness for digital transformation. <b>2017</b> , 15,	15
90	Designing an Agent-Based Model Using Group Model Building: Application to Food Insecurity Patterns in a U.S. Midwestern Metropolitan City. <b>2018</b> , 95, 278-289	4
89	System Dynamics. <b>2018</b> ,	2
88	Group Model Building in a Pressure Cooker: A Field Experiment with Public Policy. <b>2018</b> , 35, 139-151	4
87	2MBio, a novel tool to encourage creative participatory conceptual design of bioenergy systems □ The case of wood fuel energy systems in south Mozambique. <b>2018</b> , 172, 3890-3906	9
86	Moving alcohol prevention research forward-Part II: new directions grounded in community-based system dynamics modeling. <b>2018</b> , 113, 363-371	16
85	Interpersonal Success Factors for Strategy Implementation: A Case Study Using Group Model Building. <b>2018</b> , 133-162	0
84	A proposed portfolio analysis model for over-the-top initiatives. <b>2018</b> , 10, 352	
83	Potential benefits of model use in group model building: insights from an experimental investigation. <i>System Dynamics Review</i> , <b>2018</b> , 34, 354-384	1.6 12



82	Mental Model Alignment. <b>2018</b> , 55-68		1
81	A proposed selection process in Over-The-Top project portfolio management. <b>2018</b> , 11, 371		
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79	Communication Quality, Insight, Consensus and Commitment to Conclusions. <b>2018</b> , 45-54		
78	Dynamic modeling of the policy effect and development of electric power systems: A case in Taiwan. <b>2018</b> , 122, 377-387		14
77	A Participatory Systems Mapping (PSM) based approach towards analysis of business sustainability of rural Indian milk dairies. <b>2019</b> , 7, 1622172		
76	Requirements Based Design of Environmental System of Systems: Development and Application of a Nexus Design Framework. <b>2019</b> , 11, 3464		4
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74	Using community-based system dynamics modeling to understand the complex systems that influence health in cities: The SALURBAL study. <b>2019</b> , 60, 102215		15
73	A Multi-Methodology Approach to Creating a Causal Loop Diagram. <b>2019</b> , 7, 42		13
72	Opportunities and risks on the path forward for system dynamics. <i>System Dynamics Review</i> , <b>2019</b> , 35, 25-34	1.6	3
71	The utility of a system dynamics approach for understanding cumulative health risk from exposure to environmental hazards. <b>2019</b> , 172, 462-469		5
70	Integrated simulation for national development planning. <b>2019</b> , 48, 208-223		3
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68	Enabling Collaborative Governance through Systems Modeling Methods. <b>2020</b> ,		2
67	Attitude towards online shopping and its influence on purchase intentions: an urban Indian perspective. <b>2020</b> , 22, 326		3
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65	The Development of Attitudes Toward Scientific Models During a Participatory Modeling Process □ The Impact of Participation and Social Network Structure. <b>2020</b> , 7,		3

64	The Lake Urmia vignette: a tool to assess understanding of complexity in socio-environmental systems. <i>System Dynamics Review</i> , <b>2020</b> , 36, 191-222	1.6	3
63	Development, implementation, and evaluation of a novel guideline engine for pediatric patients with severe traumatic brain injury: a study protocol. <b>2020</b> , 1, 31		1
62	Group Model Building. <b>2020</b> , 91-107		1
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59	Project management canvas: a systems thinking framework to address project complexity. <b>2021</b> , 14, 809-835		2
58	Depicting "the system": How structural racism and disenfranchisement in the United States can cause dynamics in community violence among males in urban black communities. <b>2021</b> , 272, 113469		6
57	Promoting knowledge to policy translation for urban health using community-based system dynamics in Brazil. <b>2021</b> , 19, 53		4
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49	Encyclopedia of Complexity and Systems Science. <b>2009</b> , 4474-4486		2
48	Participatory System Dynamics Mapping for Collaboration and Socioecological Integration in the Lake Tana Region. <b>2017</b> , 615-630		1
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45	How Do We Know Who to Include in Collaborative Research? Toward a Method for the Identification of Experts. <b>2013</b> , 83-104	2
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42	Participatory system dynamics modelling for housing, energy and wellbeing interactions. <b>2018</b> , 46, 738-754	38
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38	Models and Communication in the Policy Process. <b>2011</b> , 35-37	
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35	A Research Method for Integrative Transition Simulation. <b>2013</b> , 49-81	
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32	Encyclopedia of Complexity and Systems Science. <b>2015</b> , 1-18	
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30	Burning Assets? Designing Wood Fuel Energy Strategies in Mozambique. <b>2017</b> , 422-447	
29	Building Integrated Theory. <b>2018</b> , 99-113	

28	Operations: Foundations and Processes. <b>2018</b> , 107-170		
27	Basic Elements of Group Model Building. <b>2018</b> , 19-28		
26	Encyclopedia of Complexity and Systems Science. <b>2019</b> , 1-17		
25	Systems Thinking, Mapping, and Group Model Building. <b>2019</b> , 1-18		0
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23	The Impacts of Automated Vehicles on the Transport System and How to Create Policies that Target Sustainable Development Goals. <b>2020</b> , 37-53		0
22	Boundary objects in translation: the role of language in participatory system dynamics modeling. <i>System Dynamics Review</i> ,	1.6	1
21	Examining the synergistic effect of cocoa-plantain intercropping system on gross margin: A system dynamics modelling approach. <b>2022</b> , 195, 103301		0
20	System Co-Development Through Requirements Specification. <b>2005</b> , 1-13		
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16	USING SYSTEM DYNAMICS MODELING TO ASSESS THE IMPACT OF CONNECTICUT'S GOOD SAMARITAN LAWS: A PROTOCOL PAPER.		
15	A systems view of responding to the COVID-19 pandemic: A causal loop model for Taiwan's approach.		1
14	Rigorously interpreted quotation analysis for evaluating causal loop diagrams in late-stage conceptualization. <i>System Dynamics Review</i> , <b>2022</b> , 38, 41-80	1.6	1
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12	Data_Sheet_1.docx. <b>2020</b> ,		
11	Data_Sheet_2.csv. <b>2020</b> ,		

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9	Pathways to suicide or collections of vicious cycles? Understanding the complexity of suicide through causal mapping. <b>2022</b> , 12,		1
8	Including local knowledge in coastal policy innovation: comparing three Dutch case studies. <b>2022</b> , 27, 897-914		1
7	Mapping the complexity of dementia: factors influencing cognitive function at the onset of dementia. <i>BMC Geriatrics</i> , <b>2022</b> , 22,	4.1	0
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1	Multi-Level Governance and Emergency Management: Building a Priority Assessment Matrix in the Pandemic Outbreak. <b>2023</b> , 15, 5836		0