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| **How does playing SimCIty in order to learn about pollution affect a student's perception on cooperation compare with using lecture and group work to learn about pollution?**  | **Investigate the differences in classroom learning environment when SimCity is used to teach pollution prevention as opposed to lecture and group work.**  | **How does playing SimCity in order to learn about pollution affect student’s attitudes towards their academic efficacy (in comparison to lecture and groupwork)?** |
| *Student Cohesiveness* | *Involvement*  | *Differentiation* |
| *Teacher Support* | *Differentiation* | *Task Orientation* |
| *Cooperation* | *Task Orientation* | *Computer Usage* |
| *Task Orientation* | *Investigation* | *Equity* |
| *Equity* |  | *Task Orientation* |

**TECHNOLOGY-RICH OUTCOMES FOCUSED**

**LEARNING ENVIRONMENT INVENTORY**

**(TROFLEI)**

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|  |  | **ACTUAL** | **PREFERRED** |
|  | Student Cohesiveness | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 1. | I make friends among students in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. | I know other students in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. | I am friendly to members of this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4. | Members of the class are my friends. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 5. | I work well with other class members. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 6. | I help other class members who are having trouble with their work. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 7. | Students in this class like me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 8. | In this class, I get help from other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Teacher Support** | **Almost Never** | **Seldom** | **Some times** | **Often** | **Almost Always** | **Almost Never** | **Seldom** | **Some times** | **Often** | **Almost Always** |
| 9. | The teacher takes a personal interest in me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 10. | The teacher goes out of his/her way to help me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 11. | The teacher considers my feelings. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 12. | The teacher helps me when I have trouble with the work. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 13. | The teacher talks with me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 14. | The teacher is interested in my problems. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 15. | The teacher moves about the class to talk with me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 16. | The teacher's questions help me to understand. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Involvement** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 17. | I discuss ideas in class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 18. | I give my opinions during class discussions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 19. | The teacher asks me questions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 20. | My ideas and suggestions are used during classroom discussions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 21. | I ask the teacher questions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 22. | I explain my ideas to other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 23. | Students discuss with me how to go about solving problems. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 24. | I am asked to explain how I solve problems. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

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|  |  | **ACTUAL** | **PREFERRED** |
|  | **Task Orientation** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 25. | Getting a certain amount of work done is important to me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 26. | I do as much as I set out to do. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 27. | I know the goals for this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 28. | I am ready to start this class on time. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 29. | I know what I am trying to accomplish in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 30. | I pay attention during this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 31. | I try to understand the work in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 32. | I know how much work I have to do. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Investigation** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 33. | I carry out investigations to test my ideas. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 34. | I am asked to think about the evidence for statements. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 35. | I carry out investigations to answer questions coming from discussions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 36. | I explain the meaning of statements, diagrams and graphs. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 37. | I carry out investigations to answer questions that puzzle me. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 38. | I carry out investigations to answer the teacher's questions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 39. | I find out answers to questions by doing investigations. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 40. | I solve problems by using information obtained from my own investigations. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Cooperation** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 41. | I cooperate with other students when doing assignment work. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 42. | I share my books and resources with other students when doing assignments. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 43. | When I work in groups in this class, there is teamwork. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 44. | I work with other students on projects in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 45. | I learn from other students in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 46. | I work with other students in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 47. | I cooperate with other students on class activities. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 48. | Students work with me to achieve class goals. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

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|  |  | **ACTUAL** | **PREFERRED** |
|  | **Equity** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 49. | The teacher gives as much attention to my questions as to other students' questions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 50. | I get the same amount of help from the teacher as do other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 51. | I have the same amount of say in this class as other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 52. | I am treated the same as other students in this class. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 53. | I receive the same encouragement from the teacher as other students do. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 54. | I get the same opportunity to contribute to class discussions as other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 55. | My work receives as much praise as other students' work. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 56. | I get the same opportunity to answer questions as other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Differentiation** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 57. | I work at my own speed. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 58. | Students who work faster than me move on to the next topic. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 59. | I am given a choice of topics. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 60. | I am set tasks that are different from other students’ tasks. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 61. | I am given work that suits my ability. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 62. | I use different materials from those used by other students | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 63. | I use different assessment methods from other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 64. | I do work that is different from other students’ work. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Computer Usage** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 65. | I use the computer to type my assignments. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 66. | I use the computer to email assignments to my teacher. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 67. | I use the computer to ask the teacher questions.  | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 68. | I use the computer to find out information about the course. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 69. | I use the computer to read lesson notes prepared by the teacher. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 70. | I use the computer to find out information about how my work will be assessed. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 71. | I use the computer to take part in online discussions with other students. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
|  | **Young Adult Ethos** | Almost Never | Seldom | Some times | Often | Almost Always | Almost Never | Seldom | Some times | Often | Almost Always |
| 73. | I am treated like a young adult. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 74. | I am given responsibility. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 75. | I am expected to think for myself. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 76. | I am dealt with as a grown up. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 77. | I am regarded as reliable. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 78. | I am considered mature. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 79. | I am given the opportunity to be independent. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 80. | I am encouraged to take control of my own learning. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |