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A systematic review of approaches to assessing cybersecurity awareness (Article)

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Abstract

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Purpose – The purpose of this paper is to survey, explore and inform researchers about the previous methodologies applied, target audience and coverage of previous assessment of cybersecurity awareness by capturing, summarizing, synthesizing and critically comment on it. It is also conducted to identify the gaps in the cybersecurity awareness assessment research which warrants the future work. **Design/methodology/ approach** – The authors used a systematic literature review technique to search the relevant online databases by using pre-defined keywords. The authors limited the search to retrieve only English language academic articles published from 2000 to 2014. Relevant information was extracted from the retrieved articles, and the ensuing discussion centres on providing the answers to the research questions. **Findings** – From the online searches, 14 studies that matched the search criteria were retrieved, and the information extracted from each study includes the authors, publication year, assessment method used, target audiences, coverage of assessment and assessment goals. **Originality/value** – The review of the retrieved articles indicates that no previous research was conducted in the assessment of the cybersecurity awareness using a programme evaluation technique. It was also found that few studies focused on youngsters and on the issue of safeguarding personal information. © Emerald Group Publishing Limited.

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(2020) *Lecture Notes in Networks
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Cybersecurity User Awareness
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- 1 Abawajy, J.H., Thatcher, K., Kim, T.-H.
Investigation of stakeholders commitment to information security awareness programs
(2008) *Proceedings of the 2nd International Conference on Information Security and Assurance, ISA 2008*, art. no. 4511613, pp. 472-476. Cited 6 times.
ISBN: 978-076953126-7
doi: 10.1109/ISA.2008.25
[View at Publisher](#)
-
- 2 Aïmeur, E., Schonfeld, D.
The ultimate invasion of privacy: Identity theft
(2011) *2011 9th Annual International Conference on Privacy, Security and Trust, PST 2011*, art. no. 5971959, pp. 24-31. Cited 20 times.
ISBN: 978-145770584-7
doi: 10.1109/PST.2011.5971959
[View at Publisher](#)
-
- 3 Albrechtsen, E.
A qualitative study of users' view on information security
(2007) *Computers and Security*, 26 (4), pp. 276-289. Cited 197 times.
doi: 10.1016/j.cose.2006.11.004
[View at Publisher](#)
-
- 4 Atkinson, S., Furnell, S., Phippen, A.
Securing the next generation: enhancing e-safety awareness among young people
(2009) *Computer Fraud and Security*, 2009 (7), pp. 13-19. Cited 29 times.
doi: 10.1016/S1361-3723(09)70088-0
[View at Publisher](#)
-
- 5 Bates, R.
A critical analysis of evaluation practice: The Kirkpatrick model and the principle of beneficence
(2004) *Evaluation and Program Planning*, 27 (3), pp. 341-347. Cited 170 times.
doi: 10.1016/j.evalprogplan.2004.04.011
[View at Publisher](#)
-
- 6 Boyd, D.
Why youth (Heart) social network sites: The role of networked publics in teenage social life
(2007) *Macarthur Foundation Series on Digital Learning – Youth*, pp. 119-142. Cited 1175 times.
Identity, and Digital Media Volume
-
- 7 Broadhurst, R., Chang, L.Y.C.
Cybercrime in Asia: Trends and challenges
(2013) *Handbook of Asian Criminology*, pp. 49-63. Cited 19 times.
<http://www.springer.com/in/book/9781461452171>
ISBN: 978-146145218-8; 978-146145217-1
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(2008) *Information Security Journal*

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(2015) *2015 International Conference on Information Systems: Exploring the Information Frontier, ICIS 2015*

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-
- 8 Bulgurcu, B., Cavusoglu, H., Benbasat, I.
Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness
(2010) *MIS Quarterly: Management Information Systems*, 34 (SPEC. ISSUE 3), pp. 523-548. Cited 737 times.
[View at Publisher](#)
-
- 9 Caputo, D.D., Pfleeger, S.L., Freeman, J.D., Johnson, M.E.
Going spear phishing: Exploring embedded training and awareness
(2014) *IEEE Security and Privacy*, 12 (1), art. no. 6585241, pp. 28-38. Cited 59 times.
doi: 10.1109/MSP.2013.106
[View at Publisher](#)
-
- 10 Charoen, D., Raman, M., Olfman, L.
Improving end user behaviour in password utilization: An action research initiative
(2008) *Systemic Practice and Action Research*, 21 (1), pp. 55-72. Cited 21 times.
doi: 10.1007/s11213-007-9082-4
[View at Publisher](#)
-
- 11 Chen, C.C., Shaw, R.S., Yang, S.C.
Mitigating information security risks by increasing user security awareness: A case study of an information security awareness system
(2006) *Information Technology, Learning and Performance Journal*, 24 (1), pp. 1-15. Cited 37 times.
-
- 12 Choo, K.-K.R.
The cyber threat landscape: Challenges and future research directions
(2011) *Computers and Security*, 30 (8), pp. 719-731. Cited 203 times.
doi: 10.1016/j.cose.2011.08.004
[View at Publisher](#)
-
- 13 Cole, J.I., Suman, M., Schramm, P., Zhou, L., Salvador, L.
(2013) *The Digital Future Project*. Cited 2 times.
Center for the Digital Future, Los Angeles, CA
-
- 14 Cone, B.D., Irvine, C.E., Thompson, M.F., Nguyen, T.D.
A video game for cyber security training and awareness
(2007) *Computers and Security*, 26 (1), pp. 63-72. Cited 98 times.
doi: 10.1016/j.cose.2006.10.005
[View at Publisher](#)
-
- 15 Dlamini, M.T., Eloff, J.H.P., Eloff, M.M.
Information security: The moving target
(2009) *Computers and Security*, 28 (3-4), pp. 189-198. Cited 78 times.
doi: 10.1016/j.cose.2008.11.007
[View at Publisher](#)
-

- 16 Drevin, L., Kruger, H.A., Steyn, T.
Value-focused assessment of ICT security awareness in an academic environment

(2007) *Computers and Security*, 26 (1), pp. 36-43. Cited 34 times.
doi: 10.1016/j.cose.2006.10.006

[View at Publisher](#)

- 17 Furman, S., Theofanos, M.F., Choong, Y.-Y., Stanton, B.
Basing cybersecurity training on user perceptions

(2012) *IEEE Security and Privacy*, 10 (2), art. no. 6112743, pp. 40-49. Cited 20 times.
doi: 10.1109/MSP.2011.180

[View at Publisher](#)

- 18 Furnell, S.
End-user security culture: A lesson that will never be learnt?

(2008) *Computer Fraud and Security*, 2008 (4), pp. 6-9. Cited 26 times.
doi: 10.1016/S1361-3723(08)70064-2

[View at Publisher](#)

- 19 Furnell, S.
Jumping security hurdles

(2010) *Computer Fraud and Security*, 2010 (6), pp. 10-14. Cited 11 times.
doi: 10.1016/S1361-3723(10)70067-1

[View at Publisher](#)

- 20 Furnell, S., Thomson, K.-L.
From culture to disobedience: Recognising the varying user acceptance of IT security

(2009) *Computer Fraud and Security*, 2009 (2), pp. 5-10. Cited 57 times.
doi: 10.1016/S1361-3723(09)70019-3

[View at Publisher](#)

- 21 Furnell, S.M., Bryant, P., Phippen, A.D.
Assessing the security perceptions of personal Internet users

(2007) *Computers and Security*, 26 (5), pp. 410-417. Cited 97 times.
doi: 10.1016/j.cose.2007.03.001

[View at Publisher](#)

- 22 Furnell, S., Tsaganidi, V., Phippen, A.
Security beliefs and barriers for novice Internet users

(2008) *Computers and Security*, 27 (7-8), pp. 235-240. Cited 37 times.
doi: 10.1016/j.cose.2008.01.001

[View at Publisher](#)

23 Gross, J.B., Rosson, M.B.

Looking for trouble: Understanding end-user security management

(2007) *Proceedings of the 2007 Symposium on Computer Human Interaction for the Management of Information Technology, CHIMIT '07*, art. no. 1234786. Cited 33 times.

doi: 10.1145/1234772.1234786

[View at Publisher](#)

24 Hagen, J., Albrechtsen, E., Ole Johnsen, S.

The long-term effects of information security e-learning on organizational learning

(2011) *Information Management & Computer Security*, 19 (3), pp. 140-154. Cited 15 times.

doi: 10.1108/09685221111153537

[View at Publisher](#)

25 The world in 2014: ICT facts and figures

(2014) *International Telecommunication Union*. Cited 8 times.

ITU, accessed 29 April 2015

www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf

26 Johansson, A., Götestam, K.G.

Internet addiction: characteristics of a questionnaire and prevalence in Norwegian youth (12-18 years).

(2004) *Scandinavian journal of psychology*, 45 (3), pp. 223-229. Cited 253 times.

doi: 10.1111/j.1467-9450.2004.00398.x

[View at Publisher](#)

27 Johnson, E.C.

Security awareness: Switch to a better programme

(2006) *Network Security*, 2006 (2), pp. 15-18. Cited 33 times.

<http://www.elsevier.com/locate/netsec>

doi: 10.1016/S1353-4858(06)70337-3

[View at Publisher](#)

28 Karjalainen, M., Siponen, M.

Toward a New Meta-Theory for Designing Information Systems (IS) Security Training Approaches

(2011) *Journal of the Association for Information Systems*, 12 (8), pp. 518-555. Cited 62 times.

<http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1584&context=jais>

[View at Publisher](#)

29 Kim, E.B.

Recommendations for information security awareness training for college students

(2014) *Information Management and Computer Security*, 22 (1), art. no. 17104145, pp. 115-126. Cited 24 times.

doi: 10.1108/IMCS-01-2013-0005

[View at Publisher](#)

- 30 Kitchenham, B.
(2004) *Procedures for Performing Systematic Reviews*. Cited 1302 times.
Keele University, Keele
-
- 31 Kritzinger, E., Von Solms, S.H.
Cyber security for home users: A new way of protection through awareness enforcement

(2010) *Computers and Security*, 29 (8), pp. 840-847. Cited 61 times.
doi: 10.1016/j.cose.2010.08.001

View at Publisher
-
- 32 Kruger, H.A., Kearney, W.D.
A prototype for assessing information security awareness

(2006) *Computers and Security*, 25 (4), pp. 289-296. Cited 142 times.
doi: 10.1016/j.cose.2006.02.008

View at Publisher
-
- 33 Kruger, H., Drevin, L., Steyn, T.
A vocabulary test to assess information security awareness

(2010) *Information Management & Computer Security*, 18 (5), pp. 316-327. Cited 32 times.
doi: 10.1108/09685221011095236

View at Publisher
-
- 34 Labuschagne, W.A., Burke, I., Veerasamy, N., Eloff, M.M.
Design of cyber security awareness game utilizing a social media framework

(2011) *2011 Information Security for South Africa - Proceedings of the ISSA 2011 Conference*, art. no. 6027538. Cited 15 times.
ISBN: 978-145771483-2
doi: 10.1109/ISSA.2011.6027538

View at Publisher
-
- 35 Levy, Y., Ellis, T.J.
A systems approach to conduct an effective literature review in support of information systems research

(2006) *Informing Science*, 9, pp. 181-211. Cited 508 times.
<http://inform.nu/Articles/Vol9/V9p181-212Levy99.pdf>

View at Publisher
-
- 36 Leiner, B.M., Cerf, V.G., Clark, D.D., Kahn, R.E., Kleinrock, L., Lynch, D.C., Postel, J., (...), Wolff, S.S.
The Past and Future History of the Internet

(1997) *Communications of the ACM*, 40 (2), pp. 102-108. Cited 109 times.
<http://dl.acm.org/citation.cfm?id=J79>
doi: 10.1145/253671.253741

View at Publisher
-

37 Livingstone, S., Bober, M., Helsper, E.
Internet literacy among children and young people: Findings from the UK children go online project
(2005) *LSE Research Online*. Cited 4 times.
London, accessed 5 July 2014
<http://eprints.lse.ac.uk/archive/00000397>

38 Loibl, T.R.
Identity theft, spyware and the law

(2005) *Proceedings of the 2005 Information Security Curriculum Development Conference, InfoSecCD '05*, pp. 118-121. Cited 2 times.
ISBN: 1595932615; 978-159593261-7
doi: 10.1145/1107622.1107650

[View at Publisher](#)

39 Mani, D., Choo, K.-K.R., Mubarak, S.
Information security in the South Australian real estate industry: A study of 40 real estate organisations

(2014) *Information Management and Computer Security*, 22 (1), art. no. 17104141, pp. 24-41. Cited 10 times.
doi: 10.1108/IMCS-10-2012-0060

[View at Publisher](#)

40 May, C.
Approaches to user education

(2008) *Network Security*, 2008 (9), pp. 15-17. Cited 6 times.
doi: 10.1016/S1353-4858(08)70109-0

[View at Publisher](#)

41 Mertens, D.M., Wilson, A.T.
(2012) *Program Evaluation Theory and Practice: A Comprehensive Guide*. Cited 104 times.
Guilford Press, New York

42 Newman, G.R., McNally, M.M.
Identity Theft Literature Review
(2005) *US Department of Justice*, p. 114. Cited 47 times.

43 Newman, R.C.
Cybercrime, identity theft, and fraud: Practicing safe internet - Network security threats and vulnerabilities

(2007) *Proceedings of the 2006 Information Security Curriculum Development Conference, InfoSecCD '06*, art. no. 1231064, pp. 68-78. Cited 12 times.
ISBN: 1595934375; 978-159593437-6
doi: 10.1145/1231047.1231064

[View at Publisher](#)

- 44 O'Keeffe, G.S., Clarke-Pearson, K., Mulligan, D.A., Altmann, T.R., Brown, A., Christakis, D.A., Falik, H.L., (...), Nelson, K.G.

Clinical report - The impact of social media on children, adolescents, and families
(Open Access)

(2011) *Pediatrics*, 127 (4), pp. 800-804. Cited 618 times.
<http://pediatrics.aappublications.org/cgi/reprint/127/4/800>
doi: 10.1542/peds.2011-0054

[View at Publisher](#)

- 45 Pannah, E.
(2010) *Cybersecurity in Electronic Commerce: Effect of Safeguarding Personal Data on Identity Theft*. Cited 2 times.
University of Maryland, College Park, MD

- 46 Parsons, K., McCormac, A., Pattinson, M., Butavicius, M., Jerram, C.
A study of information security awareness in Australian government organisations

(2014) *Information Management and Computer Security*, 22 (4), pp. 334-345. Cited 17 times.
<http://www.emeraldinsight.com/info/journals/imcs/imcs.jsp>
doi: 10.1108/IMCS-10-2013-0078

[View at Publisher](#)

- 47 Peltier, T.R.
Implementing an information security awareness program

(2005) *Information Systems Security*, 14 (2), pp. 37-49. Cited 44 times.
doi: 10.1201/1086/45241.14.2.20050501/88292.6

[View at Publisher](#)

- 48 Developing a culture of privacy: A case study

(2007) *IEEE Security and Privacy*, 5 (6), pp. 58-60. Cited 9 times.
doi: 10.1109/MSP.2007.163

[View at Publisher](#)

- 49 Rantos, K., Fysarakis, K., Manifavas, C.
How Effective Is Your Security Awareness Program? An Evaluation Methodology

(2012) *Information Security Journal*, 21 (6), pp. 328-345. Cited 12 times.
doi: 10.1080/19393555.2012.747234

[View at Publisher](#)

- 50 Rezgui, Y., Marks, A.
Information security awareness in higher education: An exploratory study

(2008) *Computers and Security*, 27 (7-8), pp. 241-253. Cited 91 times.
doi: 10.1016/j.cose.2008.07.008

[View at Publisher](#)

51 Rossi, P.H., Lipsey, M.W., Freeman, H.E.
(2004) *Evaluation: A Systematic Approach*. Cited 2970 times.
Sage Publications Inc., San Francisco, CA

52 Shaw, R.S., Chen, C.C., Harris, A.L., Huang, H.-J.
The impact of information richness on information security awareness training effectiveness

(2009) *Computers and Education*, 52 (1), pp. 92-100. Cited 87 times.
doi: 10.1016/j.compedu.2008.06.011

[View at Publisher](#)

53 Siponen, M.T.
Conceptual foundation for organizational information security awareness

(2000) *Information Management and Computer Security*, 8 (1), pp. 31-41. Cited 338 times.
doi: 10.1108/09685220010371394

[View at Publisher](#)

54 Sithira, V., Nguwi, Y.
A study on the adolescent online security issues
(2014) *International Journal of Multidisciplinary and Current Research*, 2, pp. 596-601. Cited 2 times.
May/June

55 Slusky, L., Partow-Navid, P.
Students information security practices and awareness
(2012) *Journal of Information Privacy and Security*, 8 (4), pp. 3-26. Cited 10 times.

56 Talib, S., Clarke, N.L., Furnell, S.M.
An analysis of information security awareness within home and work environments

(2010) *ARES 2010 - 5th International Conference on Availability, Reliability, and Security*, art. no. 5438096, pp. 196-203. Cited 39 times.
ISBN: 978-076953965-2
doi: 10.1109/ARES.2010.27

[View at Publisher](#)

57 Tan, K.E., Ng, M.L.Y., Saw, K.G.
Online activities and writing practices of urban Malaysian adolescents

(2010) *System*, 38 (4), pp. 548-559. Cited 16 times.
doi: 10.1016/j.system.2010.09.014

[View at Publisher](#)

58 Thomson, M.E., Von Solms, R.
Information security awareness: Educating your users effectively

(1998) *Information Management and Computer Security*, 6 (4), pp. 167-173. Cited 148 times.
<http://www.emeraldinsight.com/info/journals/imcs/imcs.jsp>
doi: 10.1108/09685229810227649

[View at Publisher](#)

- 59 Tsohou, A., Kokolakis, S., Karyda, M., Kiountouzis, E.
Investigating information security awareness: Research and practice gaps
(2008) *Information Security Journal*, 17 (5-6), pp. 207-227. Cited 34 times.
doi: 10.1080/19393550802492487
[View at Publisher](#)
-
- 60 Valentine, J.A.
Enhancing the employee security awareness model
(2006) *Computer Fraud and Security*, 2006 (6), pp. 17-19. Cited 19 times.
doi: 10.1016/S1361-3723(06)70370-0
[View at Publisher](#)
-
- 61 Wang, W., Yuan, Y., Archer, N.
A contextual framework for combating identity theft
(2006) *IEEE Security and Privacy*, 4 (2), pp. 30-38. Cited 38 times.
doi: 10.1109/MSP.2006.31
[View at Publisher](#)
-
- 62 Whitson, J.
Identity theft and the challenges of caring for your virtual self
(2009) *Interactions*, 16 (2), pp. 41-45. Cited 4 times.
doi: 10.1145/1487632.1487642
[View at Publisher](#)
-
- 63 Youn, S.
Teenagers' perceptions of online privacy and coping behaviors: A risk-benefit appraisal approach
(2005) *Journal of Broadcasting and Electronic Media*, 49 (1), pp. 86-110. Cited 113 times.
doi: 10.1207/s15506878jobem4901_6
[View at Publisher](#)
-
- 64 Ajzen, I.
From intentions to actions: A theory of planned behaviour
(1985) *Action Control*, pp. 11-39. Cited 7299 times.
in Kuhl, J. and Beckmann, J., Springer, Berlin Heidelberg
-
- 65 Royse, D., Thyer, B.A., Padgett, D.K., Logan, T.K.
(2001) Program Evaluation an Introduction. Cited 190 times.
Wadsworth Cengage Learning, Belmont, CA
-
- 66 Stanton, J.M., Stam, K.R., Mastrangelo, P., Jolton, J.
Analysis of end user security behaviors
(2005) *Computers and Security*, 24 (2), pp. 124-133. Cited 366 times.
doi: 10.1016/j.cose.2004.07.001
[View at Publisher](#)
-

□ 67 Yarbrough, D.B., Shulha, L.M., Hopson, R.K., Caruthers, F.A.
(2011) *The Program Evaluation Standards: A Guide for Evaluators and Evaluation Users*. Cited 207 times.
Sage Publications, San Francisco, CA

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