



UK Health
Security
Agency

Risk minimisation for radiation protection training using on line platforms

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Objective

Identify courses that would be suitable for an online platform and consider the risks

- what learning is needed
- what learning do we provide
- what of learning does the online platform provide
- how risk is reduced

Learning styles

- visual
- kinaesthetic
- aural
- social
- solitary
- verbal
- logical

$\mathcal{L} = \oint E_{at}$
 $f(w) = \int_{-\infty}^{\infty} f(x) e^{-2\pi i x w} dx \frac{dt}{d\omega}$
 $\rho \left(\frac{\partial v}{\partial t} + v \cdot \nabla v \right) = -\nabla p + \nabla \cdot T + f$
 $\nabla \cdot E = 0$
 $\nabla \times E = -\frac{1}{\epsilon} \frac{\partial H}{\partial t}$
 $\nabla \cdot H = 0$
 $\nabla \times H = \frac{1}{\epsilon} \frac{\partial E}{\partial t}$
 $(i\hbar \frac{\partial}{\partial t} \Psi = H \Psi)$
 $H = -\sum p(x) \log p(x)$
 $\frac{1}{2} G^2 S^2 \frac{\partial^2 V}{\partial S^2} + r S \frac{\partial V}{\partial S} + \frac{\partial V}{\partial t} - r \cdot V = 0$
 $TC(Q, q_i, m_i) = \sum_{i=1}^n \left[\frac{D_i}{m_i q_i} S_i + c_i v D_i + \frac{q_i H_i^v}{2} (m_i (1 - \frac{D_i}{P_i}) - 1 + 2 \frac{D_i}{P_i}) \right] +$
 $\sum_{i=1}^n \frac{q_i}{2} H_i^M + c_s \frac{D}{Q} + c_o D + \frac{Q(p-D)}{2p} H^M + F_o N + F_o N + \sum_{i=1}^n D_i w_i d_i \frac{(1+w_i)}{F_i}$
 $\left[\frac{d \Delta p(s, \phi)}{d \phi} \right] = \begin{bmatrix} \gamma & -\mathcal{L} \\ -\beta & Q \end{bmatrix} \begin{bmatrix} \Delta p(s, \phi) \\ \Delta M(s, \phi) \end{bmatrix}$
 $\int_0^{\frac{\pi}{2}} (\log \sin x)^2 dx = \int_0^{\frac{\pi}{2}} (\log \cos x)^2 dx = \frac{\pi}{2} \left\{ \frac{\pi^2}{12} + (\log 2)^2 \right\}$

Types of learners

- working closely with radiation
- not working closely with radiation but involved with the work

What activities do we use to help people learn?

Our courses

- knowledge acquisition
- practical work
- calculations
- problem solving
- role playing
- teamwork
- tests

What activities does an online platform use to help people learn?

The type of learning available are:

- video steps
- audio steps
- article steps
- discussion steps (requires input)
- polls
- exercises (requires input)
- quizzes
- tests

What activities help people learn?

Radiation protection services

- knowledge acquisition
- practical work
- calculations
- problem solving
- role playing
- teamwork
- tests

Online

- knowledge acquisition
- calculations – limited
- problem solving – limited
- tests

Selecting suitable courses



- consider continuous or course designer intervention course
- are there sufficient similarities
- is it vital they can do this calculation – is it necessary to check?
- is a live educator needed, or will a video giving feedback suffice?

Types of courses that can be transferred to online platforms

- working closely with radiation

this usually requires a course that cannot be transferred to online platform

- not working closely with radiation but involved with the work

usually require courses that provide radiation safety protection and health effects information without practical work

- **shorter the course – more likely it can be transferred to online platforms**

Benefit of an online platform course. (Learner)

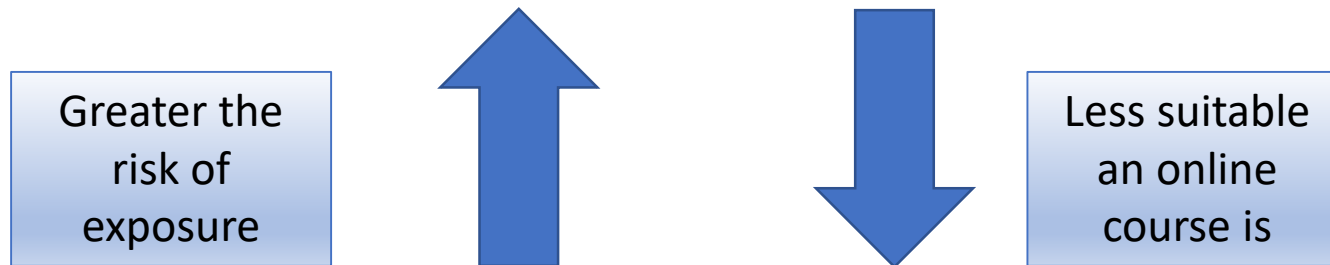
- learning is driven by the individual
- information is chunked
- learner centred
- increased participation
- knowledge consolidation

Benefit of an online platform course. (Employer)

- certificates of attendance give reasonable assurance of employee engagement with the course
- employer has readily available record of training
- training can be done at any time or part of onboarding
- can engage with lots of people at the same time

Conclusion

Generally, if the risk of exposure is greater, then online platform courses are unlikely to be able to provide sufficient and suitable information and instruction to satisfy an ALARP ethos.





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