Deep learning is usually applied to static datasets. If used for classification based on data streams, it is not easy to take into account a non-stationarity. This thesis presents work in progress on a new method for online deep classification learning in data streams with slow or moderate drift, highly relevant for the application domain of malware detection. The method uses a combination of multilayer perceptron and variational autoencoder to achieve constant memory consumption by encoding past data to a generative model. This can make online learning of neural networks more accessible for independent adaptive systems with limited memory. First results for real-world malware stream data are presented, and they look promising.